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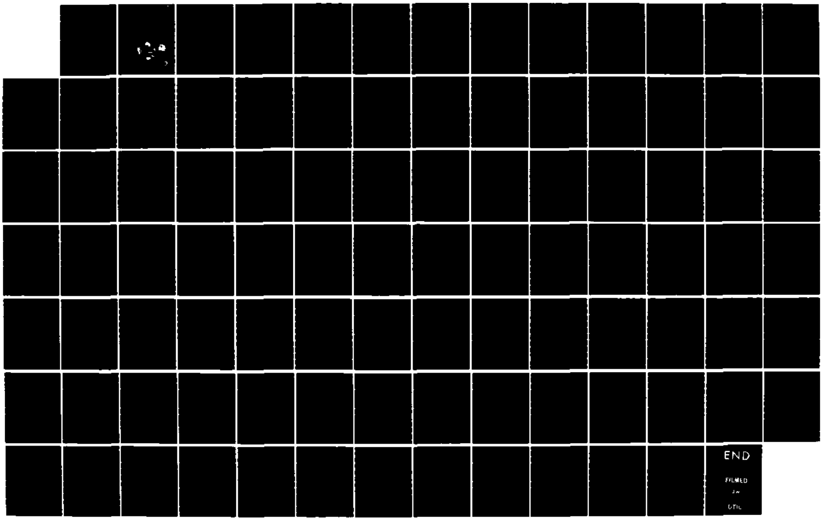

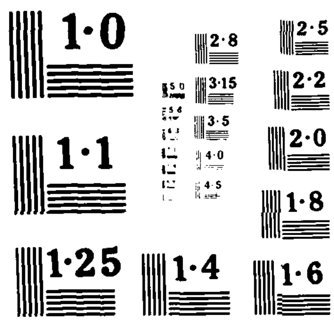
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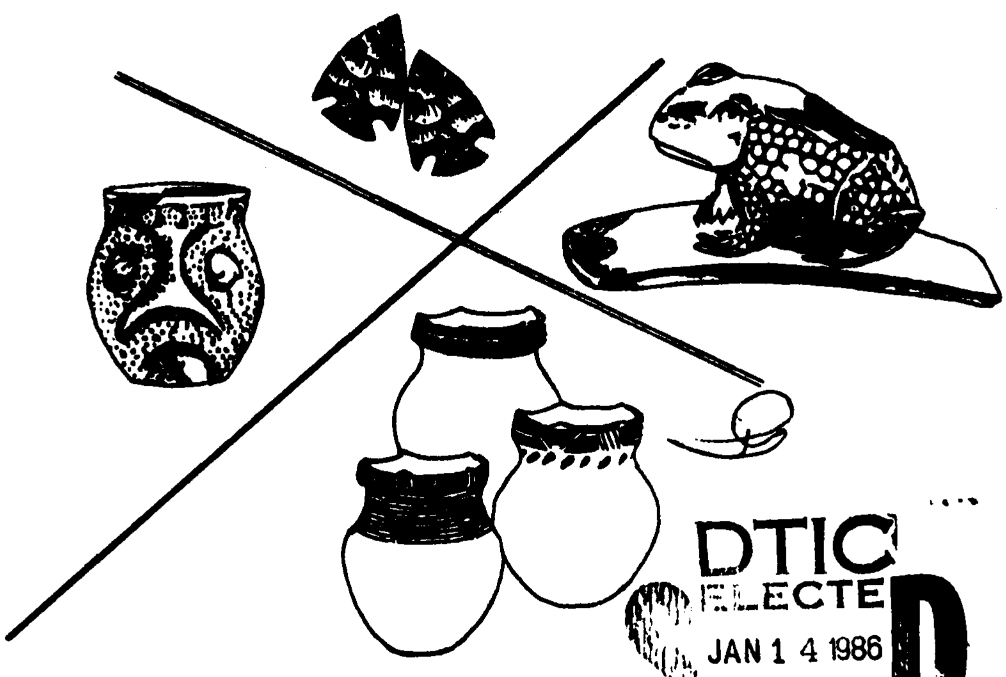
GREAT LAKES ARCHAEOLOGICAL RESEARCH CENTER, INC.

Reports of Investigation No. 167

THE ARCHAEOLOGY OF CORALVILLE LAKE, IOWA

VOLUME III: SAMPLE SURVEY (INTERIM REPORT I)



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THE ARCHAEOLOGY OF CORALVILLE LAKE, IOWA

VOLUME III: SAMPLE SURVEY (INTERIM REPORT 1)

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A B S T R A C T

Reports of Investigations No. 156 entitled "Archaeological Investigations At Coralville Lake - Results of Mangement Phases O-I" is an interim report. Essentially, the report is a comprehensive progress report that details work completed to date under the auspices of contract number DACW25-84-C-0033. Management Phases O-I entail development of a management data base for Coralville Lake and the completion of a 20% stratified random sample survey of the project area. In addition to these two primary tasks, ancillary work included test excavations at 5 archaeological sites, none of which are considered eligible for The National Register of Historic Places. Finally, the results of both literature and archives search and field investigations related to the surficial geology of the project lcoality are incorporated in this interim report.

A total of 1858 hectares comprising 21.5% of the Coralville Lake project area was subjected to archaeological survey. Sixty-four previously unrecorded sites were found within the sample units. Twenty-five previously reported sites, located within the sample units were revisited. New site boundaries were determined and additioinal cultural materials were collected. Information from field and lab-based investigations were incorporated within the automated data management system.

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INTRODUCTION:

This interim report summarizes the results of archaeological investigations at Coralville Lake, Iowa. The investigations were conducted under the auspices of Contract No DACW25-84-C-0033 which provides for Cultural Resources Management Plan Development and Intensive Survey. The results of the management plan development task may be found in Overstreet (1985). This document presents the findings and conclusions of three elements of the over-all management plan: (1) Data transformation, reorganization, and CADD mapping; (2) Intensive survey (completion of a 21.5 percent stratified random sample of the reservoir area) and test excavations; and (3) Evaluation of existing geomorphic data at Coralville Lake from both literature and field based study.

Management Phase O entails review of all existing site information including survey and excavation and development of a data base in the form of a geographic information system. The task provides for updating of existing information in a format which will allow for comprable integration of data from future investigations. Management Phase I encompasses development of sampling units based on existing geomorphic map units developed by Finney (Emerson et al 1984), implementation of a stratified random sample, test excavations (evaluation) at 5 archaeological sites within the project area, and development of a Pleistocene and Holocene geological overview for Coralville Lake. These management phases represent two staged increments in a 9 phase plan for the project area. Phases II (biased survey of proposed development areas) and Phase III (detailed field and laboratory investigations of the surficial geology) are scheduled for 1985.

MANAGEMENT PHASE O:

This phase was implemented utilizing a computer aided drafting and design system (CADD). Base maps were provided by Rock Island District, Corps of Engineers (RID-COE) in the form of U.S.G.S. 7.5' quadrangles of the Coralville Lake area. The maps included previously reported sites, locations of several bore-holes, and the delineated boundaries of geomorphic map units defined by Emerson et al (1983). Base map data was digitized and placed on an automated system. In addition, a great metric grid was superimposed on the project area and 25 hectare sample units were defined. A second task was to calculate the area contained within each mapping unit in order to draw a random proportional sample from each stratum (defined landscape unit).

Two specific products resulted from the Phase O work. First, a series of base maps were generated by various programs and plotting schemes. These maps area scaled at 1:2000 and are attached as packet maps. The 1:2000 maps include a regional base map, sample units and archaeological sites, land-use units, geomorphic units, and an index map for the second product. The second product consists of a series of detail maps at a scale of 1:600. The 1:600 maps include the locations of sites located during the sample survey (including isolated finds) and the revised boundaries of previously known sites at Coralville Lake that were contained within the sample units. For a more detailed presentation of data files and CADD mapping refer to Overstreet (1985).

MANAGEMENT PHASE I:

As previously noted, Phase I includes operationalizing the stratified random sample of Coralville Lake Landscapes. Results of this effort are presented in the following narrative that includes a discussion of pre-field investigations, methods and techniques of survey and excavation, and the results of the the survey. In addition to this, a geological overview is presented for Coralville Lake along with the results of preliminary field investigations. Finally, the summary of surficial geology in the project area includes a discussion of data limitations and addresses the ways and means to resolve such limitations.

Pre-field Research:

A thorough examination of the pertinent records of previous archaeological investigations is one of the primary goals of Phase I of a Cultural Resources Management Plan for Coralville Lake. Thus, this report includes a detailed review of the existing literature regarding archaeological study of the Coralville Reservoir area. As an earlier report (Emerson et al 1984) details such information in part, that effort will not be entirely duplicated here. Rather a summary of previous investigations, in part from Emerson et al (1984) is presented below. The reader is invited to consult Emerson et al (1984), Weichman and Tandarich (1974), Zieglowsky and Zalesky (1981), and the references cited for more detailed consideration.

Early archaeological studies in the eastern United States often focused on the various types of mounds found throughout the area. The vicinity of the Iowa River in Johnson County was no exception. The Rev. James L. Scott (1843) and Captain F.M. Irish (1868) were two early travelers through Iowa who recorded Indian tumuli near Iowa City. In the History of Johnson County, Iowa by M.W. Davis and A.C. Trowbridge (1883), four mound groups and three historic Mesquakie villages are reported along the Iowa River. Some 100 mound groups in Johnson Co. were reported in the Smithsonian Institution's First Annual Report (Webster (1888). This work was also reported in the Proceedings of the Davenport Academy of Natural Science (Starr 1895). Early work in Iowa is representative of most archaeology carried out prior to 1900 in the Eastern United States with an emphasis placed on excavation of earth works and burials.

The early 1900's saw the beginnings of anthropological archaeology in Iowa with the work of Rev. Owen J.H. Ward. A discussion of anthropology as a science as well as the methods and results of an archaeological survey along the Iowa River were presented in a series of articles published in the Iowa Journal of History and Politics (Weichman and Tandarich 1974). Charles R. Keyes, director of the Iowa State Archaeological Survey, for over thirty years worked extensively to gather information on Iowa's prehistoric sites. Although much of the information Keyes gathered was never published, his research has been organized and a "Finder's Guide" to his notes which summarize(s) the material by county has been published (Tiffany 1981).

In conjunction with construction of the Coralville Dam, the Smithsonian Institution's River Basin Survey sponsored two projects aimed at identifying and salvaging archaeological sites which might be located within the area to be flooded. In 1946, Richard P. Wheeler surveyed the area and reported nine sites in the project area (Wheeler 1949). Warren W. Caldwell did a follow up study in 1956, conducting excavation and surface collection of 10 sites within the Reservoir. Caldwell's survey was apparently limited to an area within the conservation pool.

Beginning in the 1960's, several federal laws and regulations mandated the management of cultural resources on federally owned land and on land effected by federally funded and/or licensed projects. These laws in conjunction with a fluorescence of theoretical awareness on the part of archaeologists led to an increase in the quality and quantity of archaeological investigations conducted throughout the United States. These two phenomena influenced the most recent work within the Coralville Reservoir.

In the late 1960's, Adrian Anderson directed a series of summer field schools with students from the University of Iowa in the project area. Two reports published in <u>Prehistoric Investigations</u> edited by Marshal McKusick derived from this work. The first, <u>Review of Iowa River Valley Archaeology</u> (Anderson 1971a) documents culture history and ceramic styles in the area. It presents results of a survey of the shoreline of Coralville Lake, apparently directed at field checking sites reported by local collectors. Although survey parameters are not discussed, Anderson reports locating ten sites and testing two. He determined that these were thin lithic scatters with little research value due to disturbance. Anderson also recommended an intensive survey program for the Iowa River in order to develop settlement pattern models. In his second article (Anderson 1971b) reports on excavations at the Walters Site (13 Jh 42), an apparent Late Woodland habitation site.

Two contract projects directed by Michael S. Weichman of the Environmental Research Center were undertaken in the mid-1970's. The first is an extensive literature search of references to archaeology of the Iowa River Valley between Coralville Dam and the Cedar River. This article is apparently the source of much of the information on investigations presented in Emerson (et al 1984) and has significant influcence here. Weichman presents summary information on 33 of the sites in the project are. Among his recommendations, Weichman calls for an intensive survey of the Coralville Lake shoreline and a long term Cultural Resource Management program for Coralville Lake.

Weichman's second project was a survey along several highway corridors in the vicinity of the Lake for the Johnson County Highway Department (Weichman 1975). This survey located five new sites and relocated one previously reported site. It is noteworthy in that it was the only systematic fieldwork known for the project area west of the I-380 bridge prior to MPI.

James Zalesky, an avocational archaeologist, has prepared a paper, A Collection of Surface Finds from East Central Iowa (Zalesky 1977). This report, prepared for a class at Iowa State University, presents an inventory of sites the author located in Iowa, Linn and Johnson Counties, Iowa. The paper documented 67 sites within the Coralville Reservoir boundaries. Although the report has limitations characteristic of student papers, it is the only reference for many of the reported sites in the project area.

Duane L. Miller, another avocational archaeologist living in Iowa City, has also shown a keen interest in the archaeology of Coralville reservoir. Beginning in 1979, Mr. Miller has reported sites he located along the shore of Coralville Lake. From the information available in the site files it appears than Miller and Zalesky often collected many of the same sites.

In 1979 (Lewis 1979) a reconnaissance survey, and in 1980 (Roetzel and Strachan 1980) an intensive testing project, were carried out at the site of a sewage lagoon 1/2 mile southeast of the Coralville Dam (13 Jh 253).

In 1981, a survey of the shoreline of Coralville Lake was undertaken by the Office of the State Archaeologist under the direction of Shirley Schermer (Schermer 1983). Although conceptualized as a 20% stratified random sample of the entire lake shore, approximately 7% of the shoreline was surveyed, all of which was east of the I-380 bridge. The Iowa Office of the State Archaeologist also sponsored a status report of the known archaeological resources in the project area. The report prepared by Debby Zieglowsky and James Zalesky (1981) was designed to review previous work in the area, determine the condition of selected sites and make recommendations for resource management. The report notes that many of the sites along Coralville Lake are badly eroded (31 of 79 checked), while others have suffered little or no ill effects due to erosion. Zeiglowsly and Zalesky call for development of a long range problem orientated management plan for Coralville Lake.

An attempt to investigate possible correlations between environmental variables and settlement was presented by Shirley Schermer (1982). Statistical techniques were used to test for correlation between certain environmental variables and Late Woodland habitation sites. Schermer found a positive correlation between Late Woodland habitation sites and the following variables; amount and type of environmental diversity, landform elevation, exposure, soil drainage capabilities, proximity to a water source and proximity to a forest vegetation zone. Late Woodland habitation was not correlated with proximity to lithic sources, upland marshes, prairie and mixed prairie zones. Schermer suggests that short term campsites are likely to be found in floodplain, high terrace and upland areas, while long term multiseasonal sites will be located on low terraces.

While Schermer's results are of interest, several of her assumptions have been questioned by Emerson et al (1984). Specifically, it is doubtful that her sample of 108 sites have definite evidence of habitation, or, that they are a representative sample of Late Woodland sites in the Coralville Reservoir (Emerson et al 1984).

The most recent work at the reservoir prior to implementation of this management plan was carried out by Impact Services Inc. (Emerson et al 1984). Its primary goals were to review the existing archaeological data for the Coralville Lake area and to develop a preliminary model of the geomorphology of Coralville Lake and surrounding environs. Other goals included field checking previously recorded sites and intensive excavations at three sites in the Sugar Bottoms Recreational Area to determine eligibility of those sites for nomination to the National Register of Historic Places. The review of the literature appears comprehensive, and as noted above, forms the basis for the preceeding section. The geomorphological model, although preliminary in nature and not as defined as might be considered ideal, was used as the starting point for our stratified sample.

In our review of the previous investigations, several salient points stand out. Several of the investigators have called for intensive survey (Anderson 1971a, Weichman and Tandarich 1974) and or development of a long range management plan for the archaeological resources of Coralville Lake (Wiechman and Tandarich 1974, Zieglowsky and Zalesky 1981). Despite a rather substantial amount of work and a large and diverse body of documentation, neither of these goals has been adequately addressed.

A seldom mentioned but glaring deficiency in the collective corpus of archaeology at the reservoir is the almost complete lack of information on sites in the area west of the I-380/Highway 218 bridges. With the exception of Weichman's survey of County Road F along the north edge of this area, no archaeological investigations are reported.

While building on the extensive and generally good work that has been done in the area, the present report addresses the question of systematic survey and implements a long-term comprehensive management plan.

Despite almost 30 years of professional archaeological involvement at Coralville, it is the activity of amateur collectors which has brought the largest number of sites into the state site files. James Zalesky and Duane Miller have reported respectively, 73 and 57 sites each. A quick review of the site files indicates that between the two of them, they have probably visited nearly every known site in Coralville Reservoir.

The survey strategy of avocational archaeologists is not always clearly stated and the goals of their survey activity may be somewhat different than that espoused by the professional community. At Coralville Reservoir, the hard work and dedication of Zalesky and Miller are to be commended. Between them they have reported fully two thirds of all the sites known in the reservoir. Their apparent willingness to share their information with other archaeologists has contributed to a vastly greater number of recorded sites than might otherwise have been possible.

Methods and Techniques of Investigations:

The primary technique used during MPI Survey at Coralville was a systematic stratified random sample. The sample universe was taken to be the land around the reservoir under jurisdiction the U.S. Army Corps of Engineers. The Corps designed their dam and reservoir to maintain a pool elevation of approximately 680' above mean sea level as normal pool elevation. The dam is designed to impound flood waters to a level of 712' above mean sea level. This maximum flood pool level serves as the approximate boundary of corps managed and leased land.

The Corps of Engineers has responsibility for 24,118 acres (9760.5 hectares) of land for its Coralville operation. It holds flood easements on an additional 9,567 acres (3871.8 hectares). The pool at maximum flood elevation covers approximately 24,800 acres. These figures are taken from Emerson et. al. 1984. A portion of the federally managed land is perpetually under water in the reservoir. This includes Lake McBride, Coralville Lake and flooded portions of the Hawkeye Wildlife Area. In addition some lands were excluded from survey because the exact USACE property boundary is in dispute or the lands surround Lake McBride which was excluded from the current project. Excluded area totals 12,407 acres (5021.3 hectares). This results in a total of approximately 21,278 acres (8611 hectares) of land for the sampling universe.

The final figure for surveyable land at Coralville was derived from the CADD system maps. Due to digitizing error, erosion, uncertain boundaries and fluctuating water levels, a completely accurate measure of surveyable land in the project area was not attained.

The sampling universe was initially subdivided into natural landscape categories by Harlan Finney (Emerson et. al. 1984) as part of a geomorphological survey of Coralville Reservoir undertaken by Impact Services, Inc. These units, called geomorphic mapping units, are based upon landform soils and relief. These geomorphic mapping units were recorded on U.S.G.S. 7.5' maps by Impact Services and supplied to GLARC, Inc. by the Corps of Engineers. The geomorphic unit definitions and mapping symbols are provided in Table 1. This delineation of geomorphic units formed the basis for a series of computer generated maps of the project area. Production of these maps was an integral part of the overall project design and the system is described below.

As part of it's proposal for managing the cultural resources of Coralville Reservoir, GLARC, Inc. recommended recording all pertinent cultural and geomorphic features of the reservoir in a computer aided design and drafting (CADD) system. For this purpose we enlisted the aid of Donohue and Associates Inc., for CADD system support. The system is capable of recording 64 levels of spatial data (example; contours, drainage, road systems, prehistoric sites, etc.) for a given area. These data may then be presented in any desired combination of features and at a variety of scales. One of the features of CADD system is that numerical values associated with the graphic (i.e. area of sites or geomorphic units, length of roads, etc.) are maintained within the system. This facilitates rapid updates and measurements of irregular features. An additional feature of CADD systems is that they allow easy conversion between various land measurement schemes. This proved especially useful as we used a 25 hectare survey unit and recorded site locations using UTM coordinates as well as the more traditional legal description with section, township and range designations. Although utilization of a CADD system for archaeological survey includes substantial investment, once developed the systems offer significant benefit as a research and management tool.

At the beginning of fieldwork, a set of base data had been entered into the CADD system, and a series of maps showing Corps boundaries, a UTM grid and geomorphic mapping units was produced. These maps were the base from which a sample was drawn for survey. The area of Corps managed land was overlain with a grid composed of 25 hectare squares. These squares were numbered consecutively and a 20% sample was selected using a table of random numbers. The sample was adjusted in such a way as to ensure that at least 20% of the area of each of Finney's geomorphic mapping units was selected. Most sampling designs involving real estate tend to have some inherent biases which to a greater or lesser degree skew the sample. One form of bias in our sample involved the small and irregular nature of portions of some of the geomorphic mapping units within the project area. In several cases, the area involved was small enough that a greater than 20% sample was surveyed, often 100%. In no

TABLE 1: MAP LEGEND - PHYSICAL ENVIRONMENTS OF CORALVILLE LAKE
(From Emerson et. al. 1984)

NAME	SYMBOL
Iowan Surface	
Soils formed under forest:	
in thick aeolian sediments	SFA
in glacial till or a thin mantle of aeolian or erosional sediments and in underlying glacial till	SFT
Soils formed under savannah in a thin mantle of aeolian or erosional sediments and underlying glacial till:	SST
Soils formed under prairie in a thin mantle of aeolian or erosional sediments and in underlying glacial till:	SPT
Southern Iowa Drift Plain	
Soils formed under forest on valley slopes, hillsides, and interfluves:	
in thick aeolian sediments	PHA
in a thin mantle of aeolian sediments and in underlying glacial till or entirely in glacial till	PHT
Soils formed under forest in thick loess on prominent high lying ridgetops:	PSA
Physical environments occurring in both of the above landform regions	
Floodplains, alluvial fans, and footslopes:	F
Terraces:	
Lacking a mantle of aeolian sediments with soils formed under:	
forest	TLF
prairie	TLP
savannah	TLS
having a thick mantle of loess with soils formed under forest:	TAF
having a thick mantle of aeolian sediments with soils formed under prairie:	TAP
having at least a thin mantle of aeolian sediments with soils formed under savannah:	TAS
Undifferentiated in valleys of small streams:	TU
Altered Lands	
Limestone quarry:	XQ
Cut and fill:	XC

case, however, was coverage of a geomorphic unit less than 20%. Table 2 shows the area of each geomorphic unit in hectares, its percentage of the total and the area to be covered for a 20% sample.

The Coralville Reservoir covers portions of the area represented on four U.S.G.S. 7.5' quadrangle maps, Ely, Amana, Swisher and Iowa City West. Copies of these maps served as field and laboratory guides during the course of the survey. The scale of these maps, 1:24000 was duplicated by the CADD system. This allowed rapid coordination of the complementary sets of data from these two resources.

In any survey situation, a sample unit must be chosen to meet several criteria. Large sized units might distort some of the variation in the landscape, on the other hand small units, while providing a fine grained sample of an area, are difficult and time consuming in field operations. We selected a 25 hectare sample unit. It was felt that it reasonably satisfied the above criteria and could easily be incorporated into the UTM coordinate system.

A grid system comprised of 25 hectare units was drawn on the four topographic maps as well as being incorporated into the CADD data base. These units were numbered for each topographic map and a sample (without replacement) was drawn with the aid of a table of random numbers to ensure that the survey covered the entire reservoir area in a proportioned manner. In effect, a 20% sample of the project lands was drawn from each of the four topographic maps. CADD maps of the various geomorphic mapping units (GMU) were overlain on the topographic maps with survey units selected. Proportions of the GMU selected by the sample were tabulated and adjustment made to ensure that at least 20% of each of the geomorphic units were selected. These adjustments were necessary because land forms are not randomly distributed across the project land and because some of the geomorphic units are so small that the random sample by topographic map missed them completely. Geomorphic units SFT, SST, and TAS were not chosen by the original sample. These units or portions there of were surveyed "out of sample". Adjustments made to the sample consisted of rejecting submerged units and occasionally selecting additional random units in order to obtain at least a 20% sample.

Any attempt at systematic archaeological survey in the real world is subject to bias. Some of the bias is introduced by the researcher while other aspects are the result of the physical and cultural features of the landscape to be sampled. The only introduced bias which might have been controlled was the over sampling of some geomorphic units. This occurred in part because our 25 hectare sample units were not always contained within a single geomorphic unit. Wherever possible, the entire 25 hectare area of a selected unit was surveyed. In many cases, this resulted in greater than 20% coverage for certain of the geomorphic units.

The nature of property ownership and the irregular shape of many of the geomorphic units introduced (some) bias

TABLE 2: CORALVILLE SURVEY COVERAGE (Hectares)

Geomorphic Mapping Unit	Area in Corps Boundary	Percentage	Sample (20%)	Area Surveyed
SFA	310	316	62	115 (37%)
SFT	9	0.1	2	9 (100%)
SST	5	0.06	1	5 (100%)
SPT	147	1.7	29	30 (20%)
PHA	882	10.24	177	240 (27%)
PHT	0	0	0	0
PSA	62	0.72	13	22 (35%)
F	4229	49.11	845	675 (16%)
TLF	0	0	0	0
TLP	1647	19.13	330	365 (22%)
TLS	304	3.53	61	164 (54%)
TAF	486	5.64	97	109 (22%)
TAP	490	5.69	98	160 (32%)
TAS	10	0.12	2	2 (20%)
TU	30	0.35	6	12 (40%)
XQ*	(114)			
XC	0			
	8611	99.99	1723	1858 (21.5%)

* not included in total

into the sample. East of the I-380 bridge, the reservoir is enclosed by a relatively narrow steep sided valley. The landscape is marked by significant relief and the boundary of Corps managed land is extremely irregular. Locating the Corps boundary markers in the field was generally challenging and occasionally impossible. Survey units east of the I-380 bridge rarely enclosed 25 hectares of surveyable land. With very few exceptions a typical unit consisted of anywhere from 5 - 50% Corps land with the remainder either water or private property.

The Corps of Engineers maintains Coralville Reservoir at a normal pool elevation of 680' A.M.S.L. In the fall of the year, from September 25th through December 15th, the pool is raised to 683' A.M.S.L. to provide greater water surface for migratory waterfowl. Since part of our survey was carried out during this time period, the amount of dry land available for survey was reduced by approximately 1865 acres (755 hectares). No exact figure was available for the area covered by the increased water level. The figure given above is an extrapolation based on the assumption that the area of the lake increases by a constant amount for each incremental rise in the water level.

In addition to a regular cyclical fluctuation in the reservoir's water level, the area is subject to periodic flooding. Several of these floods have been major episodes including a flood during the spring and early summer of 1984 when the level of the reservoir exceeded 711' A.M.S.L. The effects of the most recent flood episode were noticeable throughout the survey area. Virtually the entire reservoir east of the I-380 Bridge has suffered severe and extensive erosion. Much of the Corps land here is devoid of vegetation and has ancient (ca. 200,000 B.P.) exposed sedimentary surfaces. The survey by Emerson et al (1984) documented the extent of the erosion at the Sugar Bottoms recreational area as well as throughout the pool east of the I-380 Bridge. The MPI survey of the area noted severely eroded landscapes throughout and the complete elimination of some islands and land spits displayed on the most recent U.S.G.S. topographic maps. In all instances, our estimates of the area of geomorphic units, and land surveyed were based upon the U.S.G.S. quadrangles.

The noted discrepencies between field observation and map representation suggests that less shoreline was available for walkover than is shown on the maps. The net result is that our survey probably covered less land per unit surveyed than the measurement of that area on the maps would indicate. The best way to deal with this problem was to increase the number of units surveyed to ensure a *minimum* 20% sample. The difference between reality and maps varies with the amount of shoreline in each unit, but we estimate it to average ca. 10 - 15%.

West of the I-380 Bridge, a combination of natural and cultural phenomena again combined to bias our sample. This portion of the Corps owned land is managed by the State of

Iowa as the Hawkeye Wildlife Area and Refuge. Access to the Wildlife Refuge was prohibited during the majority of our field operation by regulation and most of this was not surveyed.

Relief west of the I-380 Bridge is much less marked, with a wide low floodplain and terrace system. The recent flooding and fall pool level left a large portion of the floodplain geomorphic unit completely flooded and/or inaccessible. The combination of flooding and refuge regulations reduced the area of floodplain available for survey by an estimated 25% (from 4229 to 3172 hectares).

In summary, biases to the sample can be characterized as restrictions in access to land due to high water, irregular boundaries and Iowa Department of Conservation regulations. Our general response to this suite of problems was to select additional random units for survey in order to maintain at least a 20% sampling fraction for each geomorphic unit and the survey area as a whole. Despite these problems our confidence in the sample procedure remains very high, both in terms of representative coverage and in terms of our ability to generate statements concerning the cultural resources of the reservoir as a whole.

In addition to the random sample, some units were selected non-randomly in order to examine particular landscapes. Two units were selected because they contained small sections of geomorphic units which the random sample had missed. Four contiguous units in a peninsula configuration formed by a bend in the Iowa River, were also surveyed, because they represented a relatively large area of moderate relief adjacent to the reservoir east of the I-380 Bridge.

<u>Survey Technique</u>:

The survey utilized two standard techniques to examine sample units for evidence of historic and prehistoric occupation. The majority of the survey was carried out by pedestrian walkover survey, a function of cultivated lands. A survey unit would be located in the field and a convenient starting point selected, usually near a unit corner or prominent local landmark. Crew members, numbering three to six, would line up at 10 meter intervals and traverse the survey unit, examining the ground surface for evidence of prior occupation. At the end of a traverse, the crew would turn and sweep in the opposite direction. The cycle would be repeated until the survey unit was covered. Any area with at least 1% ground visibility was surveyed in this manner.

Due to the recent flooding, much of the survey area had relatively "clean" exposed sediment. Vegetation was slow to recover and even wooded areas generally lacked the usual forest detritus which had apparently been swept away in the flood.

On rare occasions, the ground surface of a selected unit was completely obscured by vegetation, and it was deemed necessary to employ shovel testing. Shovel testing or shovel probing involves digging a small (ca. 30cm. x 30cm. x 30cm.) hole in the ground with a shovel and passing the sediment removed through a small hand held screen. The screen is 1/4" mesh hardware cloth. Crews line up and traverse the area to be surveyed stopping at 10 meter intervals to excavate. A grid pattern of shovel tests is thus established over the survey area.

Shovel testing examines less than 1% of the ground surface, but has the added advantage of examining subsurface phenomena. Due to high costs and low coverage, shovel testing is reserved for areas with minimal surface visibility or situations with suspected near surface buried material.

Crew chiefs kept records of each sweep, noting ground cover, estimate of visibility, rough sediment description, local landmarks as well as general comments on such matters as weather, time of day, and crew disposition.

When historic or prehistoric material was located, site limits were determined and the site recorded on a U.S.G.S. topographic map. After establishing site limits, the area of a site would be surveyed at close (2 meter) interval and all material visible collected. The site would be given a field number and photographed. A brief description of local site environs and landmarks was recorded to facilitate future relocation.

A problem which occurs in survey situations is how to record sites with very few artifacts. It is sometimes inappropriate to designate a locality with only one or two flakes or other artifacts as a site. The Office of the State Archaeologist of Iowa has recently decided to classify such localities as "find spots" rather than sites. In the Iowa Site records system, find spots are recorded using a separate numbering system. Consultations with Debbie Zieglowsky, who is responsible for maintaining archaeological files, determined that the cut-off point for find spot/ site designation was three items. Any locality with three or fewer artifacts was designated as a find spot. Four or more artifacts earned a locality the designation of a "site." In some cases, no collection was made of historic sites, in particular those sites with intact foundations. These localities were nevertheless classified as sites in the Iowa records.

Survey units east of the I-380 Bridge were often difficult to reach from the existing road network. To facilitate survey of these units, a johnboat with an outboard motor was employed to gain access to survey units from the river.

Survey was generally not conducted on several types of landscape. Bare limestone outcrops found throughout the area east of the I-380 Bridge were only visually inspected. In addition, very steep slopes, some almost perpendicular, were avoided unless we had to walk over and scale them to reach other tracts.

Site Records:

All material recovered from survey and test excavations are identified on a site inventory form developed for the Coralville Survey (see Appendix A). Copies are included in this report. Copies of all forms, notes, photographs and maps used in the project are temporarily housed at the Great Lakes Archaeological Research Center, Inc. laboratory in Wauwatosa, WI.

A standard site record form supplied by the Office of the State Archaeologist of Iowa was completed for each site located. Original forms were completed for new sites while updated information is provided for previously reported sites (see Appendix B).

Excavation Strategy:

The Coralville Reservoir project was designed primarily as a survey operation. That is, the goal was to inspect a portion of the landscape in order to gather information on where evidence of archaeological sites were and were not located. However, several sites were excavated in order to get some idea of the integrity of at least a small sample of the sites located during the survey. Due to time and weather constraints, only five sites; 13 Jh 492, 13 Jh 500, 13 Jh 482, 13 Jh 202, 13 Jh 479 were subjected to limited test excavations.

A standardized excavation strategy was utilized at each of the five sites. At four of the sites results of the surface collection were used to determine locations of the test units. The fifth site is a rockshelter (13 Jh 202) reported to have been completely excavated by Warren W. Caldwell (1961). No surface collection was made at this site. Test units were located on an impressionistic basis rather than as a result of any previous examination.

Test units were usually 1 x 2 meter rectangles, excavated in arbitrary 10cm. levels. Four 1 x 2 meter test units were excavated at 13 Jh 492, Jh 500 and Jh 482. Three units were dug at 13 Jh 479. At the rockshelter (13 Jh 202) two 2m. x 2m. squares and a third unit, a 1 x 2 meter, were excavated. Test units were excavated to a depth appropriate to determine the geomorphological context, usually 30 - 50 cm. Occasionally a test unit or portion thereof was excavated to a depth of a meter or more in order to get a relatively deep profile for geomorphological rather than archaeological purposes. Excavation was by trowel and/or skimming shovel, sediment was screened through a 1/4" mesh hardware cloth when possible.

The goals of the testing program in descending order were as follows:

1. Determine which if any geomorphological contexts were likely to contain intact subsurface archaeological remains.

2. Determine the depth to which artifacts were likely to be found, and the processes responsible for their vertical distribution.

3. Obtain a larger sample of artifacts as an aid in the analysis of site function and temporal/cultural affiliation.

4. Obtain a better idea of horizontal site boundaries than might be obtained from surface collection alone.

5. Locate subsurface features in order to generate additional data on site function and cultural/temporal affiliation.

Prior to testing each of the sites we had fairly strong expectations of the success we might have meeting the above goals. In particular, we were virtually certain some sites would not have subsurface integrity while others would have fairly deep or intact archaeological deposits. As can be seen in the discussion of the results of the excavations, our expectations generally coincided with reality.

Following completion of the survey, we had some impressions regarding the nature of the present archaeological resources and a general idea of the recommendations which might be made to the RID-COE in regard to managing these resources. As our recommendations are potentially controversial, it was thought that testing several sites representative of varying geomorphological conditions would strengthen our argument.

Excavation began with laying out three or four units on the site surface. The excavations were aligned with axes along the cardinal directions using a Brunton Hand Transit. Readings for contour maps of four sites were taken with a transit and stadia rod. The fifth site, 13 Jh 479 was relatively inaccessible. Here, readings were taken with a Brunton Hand Transit for drawing a sketch map of the site environs.

Excavation was by hand troweling and shovel skimming with sediment passed through a 1/4" mesh hardware cloth screen when feasible. Some classes of sediment, notably clays, fine silts and combinations thereof are difficult to coerce through a screen. In such sediments, careful trowel excavation was utilized, but seldom was the sediment screened.

A standard excavation level form (see Appendix C) was completed for each level excavated. Profile drawings, profile photographs, and where appropriate, plan view drawings were used to document the excavations. Jeffrey D. Anderson described all profiles and sediments.

Artifact Processing:

Material recovered during the course of the survey and testing at Coralville was initially stored in bags labeled with date, provenience information and surveyor/excavator. In the lab, the material was washed, labeled and inventoried. Since the vast majority of artifacts recovered were lithic tools, fragments and debitage, the inventory process emphasized lithic variables (see inventory forms). Lithic debitage was sorted according to chert type, presence/absence of evidence for heat alteration and stage of reduction sequence.

Two categories of chert type were thought to have validity for the analysis of debitage from Coralville. The categories are grey nodular chert and other. The tabular chert is a light to dark grey chert generally found in relatively thin, (3cm. or less) flat nodules with a cortex of limestone. The chert is the most predominant variety found during the survey. It is frequently heat treated and of generally good quality. The chert occurs in nodules thin enough that they may be transformed into tools with only moderate thinning. Two complete projectile points were located which were made of this chert and had cortex remaining on both faces of the tool. The grey tabular chert is available throughout the project area and may have been one of the important resources which attracted prehistoric inhabitants.

Presence of heat alteration and stage of debitage in the biface reduction sequence are important variables in the study of lithic technology. Types and frequencies of debitage also provide a primary source of data for determination of site function.

Formal lithic tools, pottery and historic artifacts were compared with known samples and described in accordance with local and regional sequences. These artifacts are used principally to indicate temporal/cultural affiliation of a site. The analysis of lithic tools including bifaces, unifaces, fragments and worked but informal implements, provides additional information pertinent to artifact function, site utilization and changing lithic techniques. Analysis was limited to tool morphology, identification, breakage patterns and rudimentary edge wear analysis (non microscopic). It should be noted that the sample of modified lithic items is small. Few sites have more than one or two items. The analysis of these items primarily provides an aid to temporal/cultural affiliation, and seldom provides insights as to how the tools themselves were used and the activities carried out at the sites from which they were recovered.

RESULTS OF MANAGEMENT PHASE I SURVEY:

The accompanying tables (3-6) summarize data for all known sites on federal land at Coralville Lake. These data reveal certain characteristics of the sites from the reservoir. For example, approximately two thirds of the sites have no recorded cultural affiliation other than "indeterminate prehistoric." In some cases this may reflect bias of the collector/recorder. For instance, 55 of the 58 sites recorded by Duane Miller are listed as indeterminate in terms of cultural affiliation. However, a listing of the material reported as recovered from Miller's sites indicates that there is justification in assigning at least a broad cultural affiliation, such as General Woodland, to some of these sites. Miller apparently used a conservative approach when assigning cultural affiliation to sites he reported.

In addition to the indeterminate category, Late Woodland and general Archaic are the most common cultural affiliations. Very few PaleoIndian, distinct Archaic or Oneota sites are noted. Those sites which have PaleoIndian, Archaic or Oneota related artifacts are usually multicomponent sites with only surface collections for recovery. With this level of information it is difficult if not impossible to separate the components into individual functional units. Presumably one or more groups of people representing lifestyles widely separated in time and utilizing unique styles of material goods and adaptive strategies occupied the same physical space over the course of several millenia. What the archaeologist sees and recovers on the ground is a jumble of artifacts, mostly debris, with a few tantalizing diagnostic points or ceramic fragments. These diagnostic materials allow one to suggest that the site was utilized by "Late Middle Archaic Helton Phase" hunters or "Early Late Woodland" agriculturalists. However, unless the site is relatively undisturbed and primarily of a single component, it is very difficult to determine how the various peoples might have used a particular site.

Compounding the problem at Coralville is the fact that there is a relatively small ratio of diagnostic tools or fragments to stone chipping debris. Even large dense sites often have only a few diagnostic artifacts and hundreds of flakes. One of the sites discovered during the recent survey had over 1100 pieces of debitage of various types, but fewer than 10 lithic tools or fragments and 16 ceramic fragments. It is probably possible for such a ratio of debitage to tools to be produced by a prehistoric group. A more likely explanation, however, is that this site and presumably most of the shoreline sites east of the I-380 Bridge have been visited by amateur collectors on one or more occasions. Collectors often tend to retrieve only formal tools and often only complete or unique specimens. The site mentioned above, 13 Jh 482, had been collected by

TABLE 3: CODES FOR REVIEW OF THE EXISTING ARCHAEOLOGICAL RECORD

Researcher:

Person who filed out original state site report is generally listed here.
Updates which changed or modified site function or affiliation are given in small column accompanying these designations.

Researchers are:

Wh:	Wheeler	Z:	Zalesky
A:	Adrian Anderson	Z & Z:	Zalesky & Zieglowsky
R:	Ruppe	S:	Schermer
Mc:	McKusick	W:	Weichman
C:	Caldwell	T:	Tandarich
M:	Miller	Sp:	Spriestersbach
E:	Emerson et. al.	K:	Krizan, Ken
P:	Perry		

Cultural Affiliation:

P:	PaleoIndian	EW:	Early Woodland
EA:	Early Archaic	MW:	Middle Woodland
MA:	Middle Archaic	LW:	Late Woodland
LA:	Late Archaic	W:	General Woodland
A:	General Archaic	O:	Oneota
H:	Historic	I:	Indeterminate Prehistoric

Affiliation given is that reported by researcher reporting or updating site record. Some sites updated for this report based on reported artifacts. Sites with pottery assigned to general Woodland if no other information available and if site would otherwise have been assigned "indeterminate" affiliation. Many sites have been visited by several researchers.

Site Function Code:

M:	mounds	Q:	quarry
C:	camp	V:	village
H:	habitation	I:	indeterminate
TS:	trash scatter	LS:	lithic scatter

Note: These designations were supplied by person reporting or updating site report. No information available on how these functions were defined or applied.

TABLE 4: CORALVILLE KNOWN SITE SUMMARY

Table code:

O.R.	Original Report
C.A.	Cultural Affiliation
U.R.	Updated Report
S.F.	Site Function
S.T.	Survey Technique
C.	Condition

Site #	O.R.	C.A.	U.R.	S.F.	S.T.	C.	Notes
2	Wh.	W, AO		V,M	S,T	F	
3	Wh	W		M,H	E	D	Reported as Completely Exc.
6	Wh	W		M	S	D	Mounds destroyed (Emerson)
8	Wh	I	W	M(Wh)	U	I	
26	A	EW-O	Z	H	S	SE	Visited by most area researchers
27	Z	EW		H	S	SE	
29	R	I		I	S	SE	
30	Z	A,LW	S	H	S	E	Cond. Poor (Z) and slight E (S)
31	Z	A,E-MW		H	S	SE	
33	Z	M-LW		H	S	SE	Emerson reports high research potential and recommends testing
36	Z	A,E-LW		H	S	ME	
37	Z	A,E-LW		H	S	ME	Z & Z report high research potential and recommend testing
42	A	LW		House	E	D	Field house, completely excav.
43	McK	E-LW	W,Z	H	S,E	ME	Excavated by Anderson, Emerson believes portion may be intact
44	A	A,W	S	H	S	SE	Reported as destroyed, eroded and cultivated
45	A	LW	W,T	TC	S	D	Under water (Anderson)
46	A	LW	S	TC	S	SE	
47	A	LW		H	S	SE	Listed as destroyed (A) and recommended for testing (Z&Z)
49	A,Z	A-LW	Z	H	S	SE	Badly eroded(E), Research pot. testing recommended (Z&Z)
50	A	I		H	U	E	Periodically flooded, historic farmstead
51	A,Z	A-LW	Z	H	S,T	SE	High research potential (S) No research potential (A)
52	A,Z	E,LW	Z	H	S	ME	High research potential (A&S)

TABLE 4: CORALVILLE KNOWN SITE SUMMARY (Cont'd)

Table code:
O.R. Original Report
C.A. Cultural Affiliation
U.R. Updated Report
S.F. Site Function
S.T. Survey Technique
C. Condition

Site #	O.R.	C.A.	U.R.	S.F.	S.T.	C.	Notes
53	Z	P,A,E-MW	Z&Z	H	S	SE	High reseach potential, tes recommended (Z&Z)
55	Z	A,LW	S,Z	H	S	SE	Shovel tested by Emerson, listed as destroyed
106	W,Z	M-LW		H	S	SE	High potential, testing rec (Z&Z)
107	W	I		H	S	C	May be endangered by road p.
108	W	MW,PrH		H	S	SE	Low research pot. (Z&Z)
109	W	I		H	S	ME	Good to excellent cond. (E)
110	W	I		H	S	SE	
111	W	I		H	S	C	Mod. erosion, high res pot
115	W	I		H	S	SE	Poor cond. severe erosion
116	W	I		H	S	SE	
117	W	W	E	C	S	SE	Erosion, flooded, destroyed
122	Z	A,LW		H	S	ME	High res. pot. (Z&Z)
123	M	I		H	S	SE	
124	M	I		C	S	ME	Periodic flooding (M,Z) Testing recommended (Z&Z)
125	M	I		C	S	SE	
126	M	I		C	S	ME	
127	Z	A,LW		H	S	E	High research potential, Testing recommended (Z&Z)
128	M	A,MW	Z	C,H	S	SE	" " " "
137	Z	A,M-LW		H	S	ME	Testing recomm., mod. eros (Z&Z), rapid eros. (Z)
138	Z	W		H	S	SE	Totally disrupted (Emerson
140	Z	LW		C	S	SE	
141	Z	E,MW		C	S	SE	

TABLE 4: CORALVILLE KNOWN SITE SUMMARY (Cont'd)

Table code:
O.R. Original Report
C.A. Cultural Affiliation
U.R. Updated Report
S.F. Site Function
S.T. Survey Technique
C. Condition

Site #	O.R.	C.A.	U.R.	S.F.	S.T.	C.	Notes
142	Z	A,LW		C	S	ME	
143	Z	A,EW		H	S	SE	
144	Z	LW		I	S	E	Periodically flooded, wind eros.
145	Z	MW		I	S	SE	" "
146	Z	LW		I	S	E	High res. pot. testing recom. (Z&Z); normally flooded (Z)
150	M	I		H	S	SE	site probably destroyed
151	Z	I		H	S	SE	salvadge recom. (Z&Z)
152	Z	I		I	S	ME	High res. pot.,testing recom. (Z&Z)
153	Z	I		I	S	ME	"" "" " "
154	Z	I		I	S	ME	"" "" " "
155	Z	I		I	S	E	"" "" " "
156	Z	I		I	S	SE	periodicall flooded, wind eros.
157	Z	LW,H	S	I	S	SE	testing recommended (Z&Z)
158	Z	I		I	S	SE	salvadge " "
159	Z	I		I	S	SE	testing " "
171	Z	A,EW		I	S	C	
172	Z	A,EW		I	S	E	
173	Z	I		I	S	C	
180	Z	I		I	S	C	
187	Z	I		I	S	C	testing recommended (Z&Z)
191	Z	I		C	S	ME	
192	Z	I		I	S	P	

TABLE 4: CORALVILLE KNOWN SITE SUMMARY (Cont'd)

Table code:
O.R. Original Report
C.A. Cultural Affiliation
U.R. Updated Report
S.F. Site Function
S.T. Survey Technique
C. Condition

Site #	O.R.	C.A.	U.R.	S.F.	S.T.	C.	Notes
193	Z	I		I	S	C	
195	Z	I		I	S	Past.	
196	Z	I		I	S	ME	
197	Z	I		I	S	ME	Periodically flooded
198	Z	I		I	S	SE	Construction & erosion damage
200	Z	I		I	S	SE	
202	C	A,EMLW	R,M	RS,H	E	D	Completely excavated
203	C	I		I	T	I	
204	C	I	R,M	I	T	I	
205	C	W,O	R,M	V	E	D	Completely excavated
206	C	W	R,M	O	S,T	I	
207	R,M	I		C	T	I	
208	C	EMLW		C	I	C	
211	Z	I		I	S	I	Cultivated & flooded
212	Z	I		I	S	C	
226	Z	I		I	S	C	
227	Z	I		H	S	SE	
228	Z	I		I	S	E	
231	Z	I		I	S	SE	
232	Z	I		I	S	Bad	normally underwater
234	Z	I		I	S	ME	
238	Z	I		I	S	E	

TABLE 4: CORALVILLE KNOWN SITE SUMMARY (Cont'd)

Table code:
O.R. Original Report
C.A. Cultural Affiliation
U.R. Updated Report
S.F. Site Function
S.T. Survey Technique
C. Condition

Site #	O.R.	C.A.	U.R.	S.F.	S.T.	C.	Notes
240	Z	I		I	S	SE	
243	Z	I		I	S	SE	
244	Z	I		I	S	E	
247	Z	I		I	S	C	
248	Z	I		I	S	C	
252	M	I		C	S	ME	Moderate pot. testing rec. (Z&Z)
253	L	I		H	S,T	D	Excavated by Roetzel & Strachan
256	M	I		I	S	E	
257	Z	I		H	S	U	Material found in dirt road
259	Z	I		H	S	ME	
260	Z	I		H	S	ME	
261	Z	I		H	S	SE	
262	M	I		H	S	E	
263	M	I		H	S	E	
264	M	I		H	S	ME	
268	Z	I		H	S	ME	
270	Z	I(W)	ST	H	S	ME	
272	M	W	E	H	S	Good	Upland site, rel. intact (Emer.)
273	M	W		H	S	SE	
274	Z	I		H	S	SE	Salvadge recommended (Z&Z)
275	Z	I		H	S	SE	" " "
276	Z	I		H	S	C	No artifacts

TABLE 4: CORALVILLE KNOWN SITE SUMMARY (Cont'd)

Table code:
O.R. Original Report
C.A. Cultural Affiliation
U.R. Updated Report
S.F. Site Function
S.T. Survey Technique
C. Condition

Site #	O.R.	C.A.	U.R.	S.F.	S.T.	C.	Notes
~~277~~	~~Z~~	~~I~~		~~H~~	~~S~~	~~SE~~	~~High potential, salvadge recom~~
~~278~~	~~Z~~	~~I~~	~~S~~	~~H~~	~~S~~	~~SE~~	
279	Z	I		H	S	ME	" " " " (Z&Z)
281	Z	I		C,H	S	ME	Moderate " " " "
282	Z	I		Q	S	SE	
298	M	I		H	S	I	
300	M	I		H	S	ME	Testing recommended (Z&Z) Usually under water (M)
301	M	I		H	S	C	
302	M	I		H	S	Poor	Usually under water
303	Z	W		H	S	ME	Testing recommended (Z&Z)
304	Z	LW	S	H	S	SE	" " "
305	Z	I		I	S	SE	
306	Z	I		I	S	ME	
307	Z	W		H	S	ME	Salvadge recommended (Z&Z)
~~308~~	~~M~~	~~I~~		~~H~~	~~S~~	~~C,E~~	~~Shovel tested by Emerson~~
~~309~~	~~M~~	~~I~~		~~Q~~	~~S~~	~~SE~~	~~Quarry & Workshop (Emerson)~~
~~310~~	~~M~~	~~I~~		~~H~~	~~S~~	~~E~~	
~~312~~	~~M~~	~~I~~		~~I~~	~~S~~	~~C~~	~~Listed as spot find in cult. fi~~
~~313~~	~~M~~	~~I~~		~~H~~	~~S~~	~~C~~	
~~314~~	~~M~~	~~I~~		~~H~~	~~S~~	~~C~~	
315	M	I		H	S	C	
316	M	I		I	S	C	Listed as spot find in cult. fi

TABLE 4: CORALVILLE KNOWN SITE SUMMARY (Cont'd)

Table code:

O.R.	Original Report
C.A.	Cultural Affiliation
U.R.	Updated Report
S.F.	Site Function
S.T.	Survey Technique
C.	Condition

Site #	O.R.	C.A.	U.R.	S.F.	S.T.	C.	Notes
317	M	I		H	S	C	
318	M	I		H	S	E	
319	M	I		H	S	SE	
320	M	I		H	S	E	
321	M	I		H	S	E	
322	M	I		H	S	I	May be disturbed by constructior Partially in woods (Emerson)
323	M	I		H	S	E	
324	M	I		H	S	E	
325	M	I		C	S	C	
326	M	I (A)	E	C	S	E	Durst pt. indicates Archaic (E)
327	M	I		H	S	E	
328	M	I		H	S	E	
330	M	I	S	H	S	SE	Usually underwater (M) Moderate erosion (S)
331	M	I (W)	ST	M?	S	POOR	Possible mound
333	M	I	E	I	S	D	
334	M	A		I	S	E	Durst pt. indicates Archaic si
338	M	I		H	S	C	
339	M	I		H	S	C	
340	M	I		H	S	SE	
354	M	I		H	S	C	
355	M	I		H	S	C	
359	M	I		H	S	C	

TABLE 4: CORALVILLE KNOWN SITE SUMMARY (Cont'd)

Table code:
O.R. Original Report
C.A. Cultural Affiliation
U.R. Updated Report
S.F. Site Function
S.T. Survey Technique
C. Condition

Site #	O.R.	C.A.	U.R.	S.F.	S.T.	C.	Notes
360	S	LW		H	S	SE	Single sherd may have come from another site (Emerson)
361	S	LW		H	S	ME	
362	S	A,MW		H	S	SE	Testing recommended (S)
363	S	I		H	S	ME	
364	S	H		F	S	E	Historic debris
365	S	I		H	S	E	
366	S	I		I	S	ME	Find spot
367	S	I		H	S	SE	
368	S	I		H	S	ME	
369	S	I		H	S	SE	
370	S	A,LW		H	S	ME	
371	S	LW,H		C,H	S	E	
372	S	A,LW		H	S	E	Part of site dredged for const.
373	S	I		H	S	ME	Cultivated, mod to sev. erosion
374	S	I		I	S	E	Spot find in eroded field road
375	S	I		I	S	E	Spot find in trail cut
376	S	I		I	S	ME	" " " "
377	S	LW		H	S	SE	Salvadge recommended
378	S	I		H	S	SE	Testing & salvadge recommened
379	S	LW,H		H	S	ME	
380	S&S	LW		H	S	SE	
381	S&S	LW		H	S	SE	Salvadge recommended

TABLE 4: CORALVILLE KNOWN SITE SUMMARY (Cont'd)

Table code:
O.R. Original Report
C.A. Cultural Affiliation
U.R. Updated Report
S.F. Site Function
S.T. Survey Technique
C. Condition

Site #	O.R.	C.A.	U.R.	S.F.	S.T.	C.	Notes
384	M	I		H	S	Poor	Normally underwater
385	M	I(W)	ST	H	S	E	
386	M	I(W)	ST	H	S	E	
389	S	I		H	S	SE	
390	S	I		H	S	E	"slow erosion" (S)
391	S	M,LW, H		H	S	E	
392	S	H		I	S	SE	Historical material, not coll.
393	S	I		H	S	ME	
394	S&S	I		H	S	Good	Flakes found eroding from trail cut, portion may be in woods
395	S	A,LW		H	S	SE	Immediate testing (S)
396	S	I		I	S	E	Spot find, Archaic pt. from disturbed context
397	S	I		H	S	SE	Point from disturbed context suggests MW (Emerson)
398	M	I		H	S	E	Located on R.V. trail
399	M	I		H	S	E	Sandy area eroded by R.V.'s
409	K	I(W)		LS	S	SE	Lithics & potsherds indicate W
422	M	I		H	S	SE	Construction, flooding, eros.E
425	M	I		H	S	C	
428	M	I		H	S	C	
434	M	I		H	S	C	
435	M	I		I	S	C	Listed as spot find
436	M	I		H	S	C	

TABLE 5: STATUS UPDATE - PREVIOUSLY KNOWN SITES

Flooded	Med-Sev Erosion	Destroyed	Slightly Eroded	Indet.	Cultivated	Good
2, 45,	26,27,29,	3*,6,42*,	30,50,	8,203,	107,111,	272,
232,302,	31,33,36,	202*,205*	127,144,	204,206,	171,173,	394
384	37,43,44,	253	146,155,	207,211,	180,187,	
	46,47,49,		172,228,	257,298	193,208	
	51,52,53,		228,238,	322	212,226,	
	55,106,108,		243,244,		247,248,	
	110,115,116,		256,262,		276,301,	
	117,122,123,		263,310,		308,312,	
	124,125,126,		318,320,		313,314,	
	128,137,138,		321,323,		316,317,	
	140,142,143,		324,326,		325,338,	
	145,150,151,		327,328,		339,354,	
	152,153,154,		364,365,		355,425,	
	156,157,158,		371,372,		428,434,	
	159,191,196,		374,375,		435,436	
	197,198,200,		385,386,			
	227,231,234,		390,391,			
	240,252,259,		396,398,			
	260,261,264,		399			
	268,270,273,					
	274,275,277,					
	278,279,281,					
	282,300,303,					
	304,305,306,					
	307,309,319,					
	329,330,333,					
	334,340,360,					
	361,362,363,					
	366,367,368,					
	369,370,373,					
	376,377,378,					
	379,380,381,					
	389,392,393,					
	395,397,409,					
	422					
5	103	6	36	9	30	2

Other Site Conditions: 192 - threatened by construction,
195 - in pasture
359 - in pasture
331 - possible mound

* (Reported as completely excavated)

TABLE 6: CORALVILLE SITE TOTALS BY COMPONENT

Indeterminate	153
PaleoIndian	1
General Archaic	28
Early Archaic	1
Middle Archaic	1
Late Archaic	1
General Woodland	27
Early Woodland	17
Middle Woodland	20
Late Woodland	42
Mound Sites	5
Historic	8
Oneota	1
	305

the adjacent landowner. He was kind enough to allow us to examine and photograph five points recovered from the site. It is not beyond the realm of possibility to suggest that other collectors have also visited this site.

The problem of a biased collection due to amateur collector activity was also noted by Emerson et al (1984). This problem is reflected in the multiple collections of many of the sites in the state site files. It is not uncommon for four or five researchers to have visited, collected, and reported a site. This multiple collection phenomenon results in several groups of artifacts, representing the collecting biases of a number of researchers, to be housed in separate facilities. The variety of collectors, techniques and storage facilities compounds the problems of cultural and functional identification for prehistoric sites.

In addition to the aforementioned problems associated with the prehistoric (archaeological) resources at Coralville, looms the most prominent factor in the project area. This is the lake itself and the associated effects on the local landscape. In plain and simple terms, the flooding and erosion associated with operation of Coralville Reservoir has destroyed the context of the majority of recorded Coralville sites. Of the 195 recorded sites at Coralville, 9 are listed as destroyed, 4 are known to be underwater, 102 are suffering from moderate to severe erosion, 36 are recorded as eroded with no reference to severity, 9 have indeterminant preservation, 32 are in cultivated fields or pastures and only 2 sites are believed to have relatively undisturbed context.

Based upon the reported sites in the project area and on our own systematic survey, there is a high probability that almost any prehistoric archaeological sites located on the shore of Coralville Lake is effectively destroyed. Previous research and our survey show that the vast majority of Coralville sites are located on the eroded shore of the lake. These sites are easy to locate since all original context sediment has been stripped away leaving the heavier artifacts exposed on more resilient and in many cases very ancient surfaces.

An archaeological site consists of those portable and nonportable artifacts and living debris left by a group of people and the surface and subsurface sediment upon which (and in which) those people lived. The more the site and its context are disturbed after original deposition, the less significant is the information available for the archaeologist. In the case of the shoreline sites at Coralville, all of the original sediment is gone along with any hope of floral and faunal remains and subsurface features. With the activity of collectors often focused on diagnostic artifacts, the remaining information from most Coralville sites dwindles to a minor percentage.

All of the researchers at Coralville have noted the erosion and several have recommended that threatened sites be immediately salvaged. Despite their best intentions, we feel that any excavation of a main shoreline site at Coralville is a futile effort. Test excavations at Sugar Bottom by Emerson et al (1984) and at several shoreline sites during the current project have documented the poor state of this class of sites. Most if not all of these sites are scatters of lithic and occasionally ceramic debris resting on an eroded surface with absolutely no subsurface context. While additional information may be gathered by means of surface collections and perhaps coordination of all previously collected materials, any subsurface excavation is likely to yield only negligible results.

Although the overall picture of archaeological resources at Coralville is somewhat dismal, there are geomorphic contexts likely to retain intact archaeological sites. Three general classes of landscape are candidates for relatively undisturbed sites and further archaeological research.

The relatively narrow, level, upland areas surrounding Coralville Lake east of the I-380 Bridge (Southern Iowa Drift Plain with soils formed under forest in thick loess on prominent high lying ridge tops; mapping symbol PSA) is one such context. The amount of land area in this category is relatively small because of the contour based boundary of federal land and because these lands are prime development spots around the lake. Roads, houses and other construction are common on ridge tops around Coralville Reservoir.

A second context is the floodplain/terrace systems of small tributary streams feeding into Coralville Lake. These smaller valleys are large enough so that a portion escapes the major erosion of the main valley. The floodplain terrace system of these streams is usually wide and flat enough to allow adequate living space.

Third, is the large, broad floodplain/terrace system along the Iowa River, east of the I-380 Bridge. This area includes over half the land owned by RID-COE, but has had very little survey. Much of this land has difficult access and requires survey techniques different from the eroded shoreline areas.

A few sites have been reported from these three landforms, but in general they have not been surveyed with the same intensity as that of the main reservoir shore. Furthermore, survey and location of sites is not as easy on those surfaces as on the eroded shoreline. The ridgetop setting is usually forested and covered with other vegetation. While the floodplain/terrace context of the small tributary streams may require shovel testing, the large Iowa River floodplain may be adequately surveyed by surface collection as much of it is currently or has been under cultivation. However, both floodplain/terrace areas are complex and subject to deposition and erosional forces. Further archaeological investigations should be undertaken in conjunction with geomorphological study in order to identify possible buried surfaces.

In summary, including the present project, over 250 archaeological sites have been recorded from Coralville Reservoir. The vast majority are sites located on badly eroded surfaces along the shore of the reservoir. In virtually all cases these sites may be considered functionally destroyed. Future management of archaeological resources should focus on survey of those landscapes likely to have relatively intact archaeological sites. Future work at sites on the eroded shoreline should be avoided as counter productive unless mandated by specific research and or management goals. Future research at Coralville might best be directed to questions relating to the use of the three above mentioned landscapes. The original shoreline environment of the Iowa River from the dam to the I-380 Bridge is effectively nonexistent.

<u>Historic Sites</u>:

Historic foundation sites are differentiated from historic sites on the basis of the presence/absence of a concrete or stone foundation. Non-foundation sites were usually small scatters of historic ceramics, glass, metal or combinations of these artifact classes.

The historic sites present an interesting anomaly to both the historian/archaeological researcher and the RID-COE. The non-foundation historic sites are difficult to interpret as they usually consist of a small quantity (ca. 10 items) of ceramic or glass fragments. Except that they delimit the approximate location of the disposal of various recent historic manufactured goods, it is difficult to discern either a management or research concern for these sites. The historic foundation sites are quite another matter.

Several hundred buildings were obtained and documented by RID-COE when it purchased the land for the Coralville Reservoir. Extensive documentation of the nature and type of buildings obtained by the Corps are presented in the 1984 report by Emerson <u>et al</u>. This report also includes information pertaining to early settlement and deed filings for counties and townships in the Coralville Reservoir and vicinity.

Emerson <u>et al</u> note that no particularly distinguished persons or architecture are represented by the historic buildings in the Corps lands (1984: 96). They characterize most historic sites as farmsteads generally representative of the "general expansion of farming and settlements into less than prime areas during the period 1850 - 1890", (1984: 97). The report points out that historic/non-Indian sites are virtually absent from the current site records for Coralville Lake. This is attributed to disinterest on the part of investigators and to a lack of specific historic site survey. Our field work indicates it is also due to limited survey west of the I-380 Bridge.

The report by Emerson et al leaves the impression that historic sites are missing from the Coralville area. They indicate that "historic remains, if they are present in the Coralville project area, should occur along many of the same ridges and terraces where prehistoric remains are found", (1984: 97, emphasis in original). These comments obviously pertain to the limited survey to date along the shoreline of Coralville Lake east of the I-380 Bridge. In this limited context, the above assessment is relevant. However, the recently completed survey located 24 historic sites, 16 of which consisted of one or more foundations representing farmsteads, homesteads, or cottages. Of the historic sites relocated, 11 foundation sites and 3 historic spot finds were located west of the I-380 Bridge. With the exception of several foundations located on the shore of a large inlet of Coralville Lake formed by Hoosier Creek, the foundations are probably common farmsteads or homesteads. The foundations along Hoosier Creek appear to be summer homes or vacation cottages. The condition of the vast majority of the foundation sites indicates that they were probably occupied up to the time of purchase by RID-COE. There is a high probability that RID-COE effected the destruction of the majority of the buildings which formerly stood on the various foundations. One of the sites we recorded, 13 Jh 505, consists of several foundations and extensive debris resulting from recent destruction of the buildings via mechanized equipment. At least two of the historic sites, 13 Jh 495 and 13 Jh 499 are represented on the contemporary U.S.G.S. maps of the area.

These several conditions present the aforementioned anomaly. On one hand the Office of the State Archaeologist would like historic foundations recorded as archaeological sites. On the other hand it is apparently RID-COE policy to acquire buildings in the flood zone of reservoirs and remove them. The foundations usually remain intact and stable and there appear to be photographs and locational information for each building in RID-COE files. Nevertheless there would seem to be some distinct damage to the historical record by the destruction of these buildings.

As noted by Emerson et al, none of the buildings acquired by RID-COE, including the remains located during our survey, are of any particular importance, either as unusual architectural entities or as the locus of famous events or people. However, despite their overly common nature, such sites may be important to future researchers interested in the lifeways of the "common man", in this case, East Central Iowa farmers. While our society is fame conscious, and records and preserves records of a variety of important things, people and events, the ordinary people and mundane lifestyles generally fail to merit preservation. The material remains of common activity meet the fate that such goods have met for millenia; use, discard, often disintegration and perhaps eventual recovery years or centuries later.

Despite the destruction of the super-structures the condition of the foundation sites is not altogether bad. Razing the buildings resulted in an obvious loss of information concerning the buildings' construction and decoration. However, in many cases photographs and legal descriptions are available so that there is a documentary record of at least the exterior appearance of these structures. Contemporary structures undoubtedly exist in the vicinity of the project area for those researchers with an interest in the architecture. Since the buildings have been destroyed and are generally "reverting to nature", further occupation or use of these sites is probably not likely. Thus, the aquisition and destruction has served in one sense to preserve these sites for future researchers. The architectual remains and associated artifacts are likely to date from a relatively narrow time span beginning in the late 19th century and ending in the mid 20th century. Given government ownership and Iowa Conservation Commission Management, the historic foundation sites west of I-380 Bridge will probably be maintained in a reasonably good, stable condition for the foreseeable future. The only probable destructive activity which will effect these sites is the growth of trees and other vegetation. Over the years, this destruction could be considerable as all of foundations west of the I-380 Bridge are in wooded areas. The foundation sites east of the I-380 Bridge are similarly protected, being located in wood lots or along isolated areas of shoreline. Barring development, these sites should also remain stable for the foreseeable future.

Prehistoric Sites:

A total of 40 new prehistoric sites and spot finds were recorded during our survey of Coralville Reservoir. Sixteen of these sites had diagnostic materials which allowed at least a rough assessment of cultural affiliation. An additional 25 previously recorded sites were revisited during the present project. Of these, nine had diagnostic artifacts which allowed us to assign them to at least a general temporal/cultural affiliation. The remaining 16 sites were assigned to indeterminate status based upon materials recovered during the present survey. Of a total of 65 prehistoric sites we located, 40 were of indeterminate cultural affiliation.

In some instances, it is possible to make an accurate assessment of activities performed at a site and/or overall site function without diagnostic materials (c.f. S.A. Ahler 1977, S.R. Ahler 1984, Raspit 1979). Such an evaluation is usually made using an analysis of lithic debitage. This was generally not the case at Coralville. Sixty of the sixty-five prehistoric sites located could not be assigned a distinct function with any confidence. These sites were usually composed of a small lithic scatter with an occasional diagnostic lithic tool or potsherd. Due to the sever erosion characterizing most of the site locations, we could not be certain that some materials had not eroded away and others reached the site by way of secondary deposition. Given these constraints, there is very little that may be done with these sites except to note that they probably mark the location of some indeterminate prehistoric activity involving the production, use, or maintenance of lithic tools.

These results, while disappointing, are not particularly surprising given the previous condition of known sites in the project locality and the distribution of the sites we found. Despite a survey designed to cover all portions of the Coralville landscape proportionately, the vast majority (55 of 65) of prehistoric sites were located east of the I-380 bridge. As was the case with the bulk of the previously recorded sites, the prehistoric sites we located east of the I-380 bridge tended to be lithic scatters on badly eroded shorelines. Twenty of the sites had one or more ceramic fragments which allowed us to assign them to at least a general Woodland category. Where distinct pottery or lithic types were found, the sites were assigned to the appropriate cultural/temporal affiliation.

Detailed information on the sites located are presented in Appendix B, copies of state site reports, and Appendix C, the detailed inventory forms completed for each site. This section will present further information on the overall archaeological collection from Coralville sites with diagnostic artifacts and the five tested sites.

In their review of the current state of archaeology at Coralville, Emerson _et al_, rightly called attention to some glaring deficiencies in the quality of information available from archaeological investigations to date in the project area. One of these deficiencies is the lack of an overall sampling survey of the area. The surveys done up to the time of Emerson's report had been primarily opportunistic surface collection. Likewise, both amateur and professional surveys have tended to examine only the eroded shoreline of Coralville Lake east of the I-380 bridge. Our survey was designed to correct some of these deficiencies and allow at least a reconnaissance level overview of cultural resources of all the federal land at Coralville.

Archaeological survey involves a systematic examination of a given area with the express purpose of aiding the determination of where archaeological remains are likely to be found and not found. Analysis of the artifacts recovered should yield considerably more information on the temporal affiliation and function of the sites located. Combined, the locational data and analysis of materials may be used to address a broad range of questions dealing with prehistoric/historic subsistence and settlement. While archaeologists, both amateur and professional, are usually most interested in finding sites and artifacts, it is important to realize that a proper survey provides data on where sites are _not_, as well as where sites are. A knowledge of those landscape categories not utilized is as important for planning and research as the knowledge that certain landscapes are routinely utilized for certain tasks/functions by certain cultural/temporal groups.

Presentation of the results of the survey for prehistoric sites is divided into sites located east and west of the I-380 Bridge. Information and analysis of sites found east of the bridge is presented first.

The overall picture of archaeological resources at Coralville is somewhat dismal. The sites we located along the shore east of the I-380 Bridge are routinely in poor to bad (terrible) condition. Interpretation of the material recovered from shoreline sites is somewhat difficult.

The primary cause of the difficulty is erosion of the shoreline. The erosion destroys context, rearranges artifacts to an unknown but probably non-trivial extent and exposes artifacts on the surface. While the exposed artifacts are easier to locate, as evidenced by the number of sites located on the eroded shoreline, they also invite the selective collection of diagnostic materials by amateurs. The net result is that most sites are lithic scatters made up exclusively of debitage.

A firm determination of site function is also difficult given the condition of the shoreline sites. The site functions of "habitation" or "camp" that have often been assigned to previously recorded sites are generally meaningless given the lack of diagnostic materials, condition of the sites, and lack of subsurface testing. Sites may be meaningfully analyzed using surface data exclusively (c.f. Ahler, 1984) but only if one is reasonably sure that the material on the surface is representative of all materials deposited at the site and of the activities responsible for their deposition. Neither of these premises apply to the shoreline sites at Coralville.

An analysis of the debitage from surface collections can provide insights into the features of the lithic industry represented by that debitage. In the case of the eroded sites at Coralville, much of the sequence of a lithic manufacturing trajectory is likely to be missing or under represented, in particular small tertiary and bifacial thinning flakes. While our inventory categorized debitage in meaningful stages in a biface production sequence, further analysis was not attempted for the majority of the sites.

We are left then, with some 64 new prehistoric sites and spot finds located during or survey and an additional 25 previously recorded sites which can add very little to an understanding of prehistoric lifeways around the present Coralville Reservoir. Those sites with diagnostic artifacts can contribute more and will be discussed below. As we have noted previously, the majority of eroded sites from the shoreline of Coralville Lake do not appear to have significant value either from a management or research perspective.

West of the I-380 Bridge, the picture of archaeological resources is somewhat different. In an area larger than the lands east of the bridge, our survey located a total of 10 prehistoric sites and spot finds including two previously recorded sites. As noted above, the landforms in this area are different from those east of the bridge. The west area is dominated by a large floodplain/terrace system with relatively mild relief and a drainage system which includes a meandering main channel and numerous sloughs, meander scars and oxbow lakes. Small active streams also cross the area. Such an environment is known to be a relatively rich habitat for various flora and fauna. Given such a rich environment and generally adequate survey conditions, we would have expected a somewhat larger number of sites than were actually located.

In general sites tend to be found on terraces near water sources rather than on the floodplain. Two of the largest sites, 13 JH 26 and 13 JH 500 were found on prominent sandy terraces. Both have suffered severe damage from wind and water erosion probably intensified by agricultural activities.

Presented below is a detailed discussion of the sites with diagnostic artifacts and the five sites tested from the Coralville survey.

Sites with Diagnostic Artifacts - Revisited - East

Seven of the revisited sites produced diagnostic materials. The materials are diagnostic to a greater or lesser degree. In some cases, artifacts allow assignment of the sites to a known archaeological time period or phase. These artifacts are often examples of well known named and dated categories (types). In either instance, the artifacts allow a general cultural/temporal, and/or activity description. The revisited sites with diagnostic materials are:

13 JH 143:

Material was recovered from a relatively narrow stretch of eroded shoreline. Site 13 Jh 143 is a large (ca. 100m x 175m) dense scatter of lithic debris and ceramic fragments. Almost 300 flakes and other pieces of lithic debris were recovered during our collection. The debris covers the full range of a biface production (lithic reduction) sequence including heat alteration of chert. Diagnostic material includes eight small grit tempered body sherds and a triangular flake point. These artifacts indicate a Late Woodland occupation and possibly Middle Woodland occupation. Previously reported materials (Emerson <u>et al</u>, 1984) assign the site to Archaic-Early Woodland. In all likelihood the site was occupied throughout the Early to Late Woodland continuum. The density and range of lithic debris would support a long term habitation function for 13 JH 143.

13 JH 145:

Site consists of a light lithic scatter (total 10 pieces) on a badly eroded reach of shoreline. The only diagnostic item recovered was the base of a small triangular point indicating a Late Woodland occupation. The site is presently classified as Middle Woodland. No designation of site function is possible with the present data.

13 JH 191:
Small, light lithic scatter on terrace of McAlister Creek. Area is subject to periodic erosion and flooding. Previous material recovered includes debitage and scrapers. No cultural affiliation is indicated in existing records. G.L.A.R.C. survey recovered a small lithic debitage collection and a small side notched bifurcate point base. The base has ground edges and is basily thinned. Although the piece is not readily identifiable, the attributes suggest Middle Archaic. No functional assignment is possible.

13 JH 227:
A medium lithic scatter (44 pieces) collected from a long stretch of severely eroded shoreline. Debitage consists predominantly of bifacial thinning flakes, tertiary flakes and broken flakes suggesting maintenance activities and/or later stages in the biface production sequence. Diagnostic material consists of large well made biface with broken base. Point has indications of slight barbs and corner notching at base. Point is made of heat treated grey tabular chert with cortex on both faces, and is similar to Synders Points.

13 JH 256:
We recovered only two lithic items as evidence of this site from a steep, severely eroded shoreline. One of the items is a well made point with deep corner notching, sharp barbs and a flaring, bifurcate base. The base exhibits minor grinding and basal thinning. It may be a Middle Woodland variety but identification is speculative at this point. Previously reported material includes debitage, a scraper/knife and cores.

13 JH 319:
Medium lithic scatter was collected on a severely eroded shoreline. A small grit tempered cordmarked body sherd was also recovered and indicates a Woodland, probably Late Woodland presence. No diagnostic material is reported from previous collections. Debitage from G.L.A.R.C. survey provides some support for activities associated with later stages in a biface reduction sequence, but this is very tenuous.

13 JH 409:
This site has been collected by Krizan (1981) and Emerson et al (1984). They each recovered a few artifacts from a severely eroded shoreline/gully setting.

Reported artifacts include a point and potsherds, (Krizan) and a side notched point, point tip and debitage (Emerson). No cultural or functional identification is offered in the existing documentation. Our survey recovered flakes and a Kramer point. The point is made of the grey tabular chert and has cortex on both faces. One face exhibits severe "pot lid" fractures, the result of exposing the point to heat, probably after manufacture.

The revisited sites east of the I-380 bridge are more or less typical of all sites in this half of the project area. All were located on eroded surfaces, most on the shore of the main lake. In most cases cultural affiliation is tenuous at best and identification of function or activities virtually impossible due to the erosion. Although we did not conduct subsurface testing at any of the revisited sites, it is extremely unlikely that any of these sites posses subsurface integrity which would warrant large scale excavation.

Sites with Diagnostic Artifacts - New - East

Thirty-two new prehistoric sites and spot finds were located east of the I-380 Bridge during the course of our survey. These sites are generally very similar to the previously recorded sites, in terms of preservation, types of material recovered and geomorphic position. Of the previously reported sites we visited, 7 of 25 (28%) yielded "diagnostic" artifacts. Twelve of the 26 (46%) new sites and two of the six (33%) new spot finds had diagnostics. The percentage of new sites with diagnostics (43.7%) is somewhat higher than that of revisited sites. This is most likely due to the fact that the known sites have been subject to multiple collections with diagnostics most commonly removed. New sites with diagnostic artifacts are:

13 JH 464:

This site was located on the severely eroded shore of an inlet of Coralville Lake. The material recovered includes the largest single sherd from the survey, a thick grit tempered cordmarked body sherd, and the only decorated rim sherd from the survey. The rim definitely resembles Spring Hollow Incised, (Logan 1976) a generalized Middle Woodland Complex. The large thick sherd could easily be a portion of the body of the same vessel or Spring Hollow Cordmarked. We also collected a small quantity of lithic debitage including acrude biface fragment.

13 JH 467:

A very small lithic scatter (three items total) on the severely eroded shore of an inlet to Coralville Lake, comprises this site. The diagnostic item is a biface made of grey heat treated chert with a broken stem, corner notching, and sharp barbs. The item is similar to Snyders Points.

13 JH 472:

This site is located ca. 100m due east of 13 JH 143, just down stream from 13 Jh 143. It consists of a small lithic scatter including a drill base. It also includes a small grit tempered body sherd. Although distinctly separate in the field during our survey, 13 JH 472 may be related to or a part of 13 JH 143. It is recorded as a separate site and assigned to general Woodland affiliation on the basis of the single sherd.

13 JH 474:

This site is a small lithic scatter located on a terrace near the maximum flood pool elevation. It is subject to moderate erosion and periodic flooding. A dozen flakes and three ceramic "crumbs" were collected. On the basis of the ceramics, the site is tentatively identified as general Woodland. No functional assessment is practical for this site.

13 JH 475:

This site is located on an eroded, level terrace which is also the location of four historic foundations (13 JH 476). Material collected at the site consists of four flakes and a large point made of a heat treated pinkish chert. The point is somewhat anomalous as one side is clearly side notched while the other is corner notched. The base of the stem is convex and the overall shape resembles Middle Woodland corner notched projectile point styles.

13 JH 479:

13 JH 479 was one of the sites we tested while at Coralville. It is located on a terrace of a small stream leading into an inlet of Coralville Lake. We tested this site because it offered an excellent chance of intact subsurface integrity. We collected surface materials from the slope of the terrace. Surface material included: nine small grit tempered body sherds (five with cordmarking), eleven flakes and two crude biface fragments. The pottery fragments suggest a Late Woodland occupation. The test excavations resulted in very little additional material. Two 1 x 2m test units were excavated near the edge of the terrace (Figure 1). Of these units, one was sterile, while the other had six additional small grit tempered body sherds and a rim sherd. The rim sherd is grit tempered with a sharply everted rim similar in shape to some late Oneota styles. The unit with pottery also had two pieces of fire cracked rock and a piece of burned sandstone. This is one of the few sites that may warrant further testing.

13 JH 480:

The artifacts representing 13 JH 480 were located on a moderately sloping, severely eroded reach of shoreline at the junction of an inlet and the main lake. Artifacts

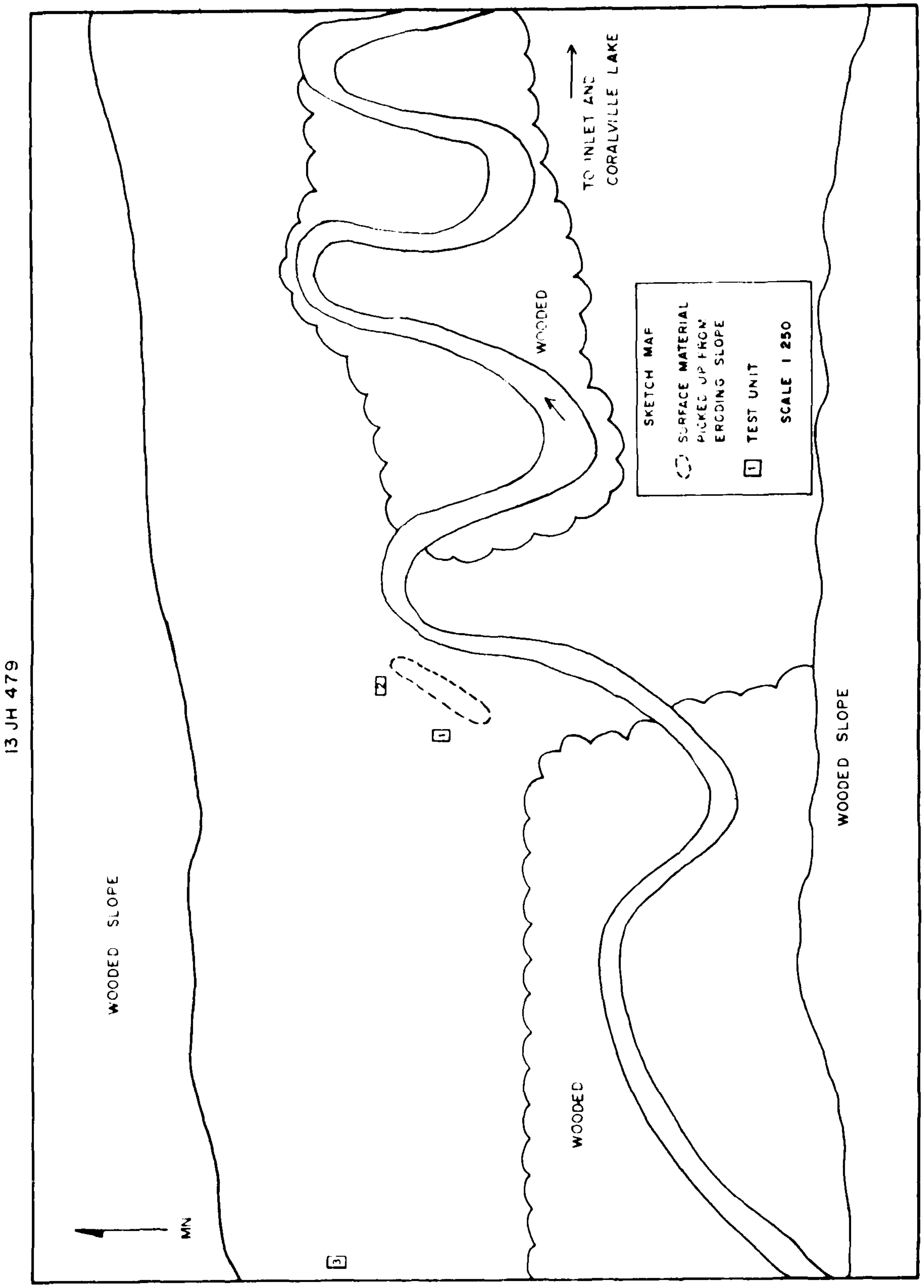


Figure 1: Sketch Map, 13 JH 479.

recovered were: nine flakes, a single grit tempered body sherd with eroded surfaces, and a rather interesting scraper/graver. The pottery fragment suggests a Woodland occupation. The scraper/graver is likely a wood or bone working tool.

13 JH 482:

This site is located on a point of land formed by two small inlets of Coralville Lake. The entire site area is severely eroded and subject to flooding. This site had the largest surface collection of any site in the project area. Approximately 1200 lithic items and 15 grit tempered ceramic fragments were collected from the surface. Two of the potsherds are rims which resemble Linn Ware (Late Middle Woodland). The lithic material is overwhelmingly debitage and represents the entire range of a biface reduction sequence. Lithic tools include fragments of two bifaces, two broken point tips, a drill base and a biface/preform.

The owner of the land directly adjacent to the site reported that his sons had periodically collected points from the site. He allowed us to examine and photograph these materials. These points include a Snyders Point and several corner notched varieties similar to points from other Middle Woodland contexts.

This site was severely eroded. Around the entire perimeter of the point limestone bedrock is currently exposed. The landowner noted above informed us that no limestone was visible when he constructed his house ca. 5-10 years before. He estimated that as much as a foot of sediment has washed away since that time. We tested this site in order to determine if any of the site remained intact. Although the slopes of the point exhibited severe erosion, the central part of the peninsula had some vegetation and did not appear to be as badly eroded. The results of testing were informative but disappointing. Four 1 x 2m units were excavated in the central portion of the site (Figure 2). One of these did not have any material while the others had relatively little considering the density of debitage on the site. A single pot sherd was recovered from unit #1. The piece is a body sherd with what appears to be smoothed over cordmarking. This places the piece within the Lane Farm Style, which is consistent with the other diagnostic materials from the site.

We would caution the reader in regard to the identification of the ceramic styles. All ceramic fragments are eroded to some degree and we have a total of three decorated pieces. The associations offered here are tentative at best.

The excavations demonstrated that the site did not have any subsurface integrity. All of the sediment on and in which the site was originally deposited has been removed by erosion. The sediment now exposed is significantly older than the archaeological materials. More detailed discussion

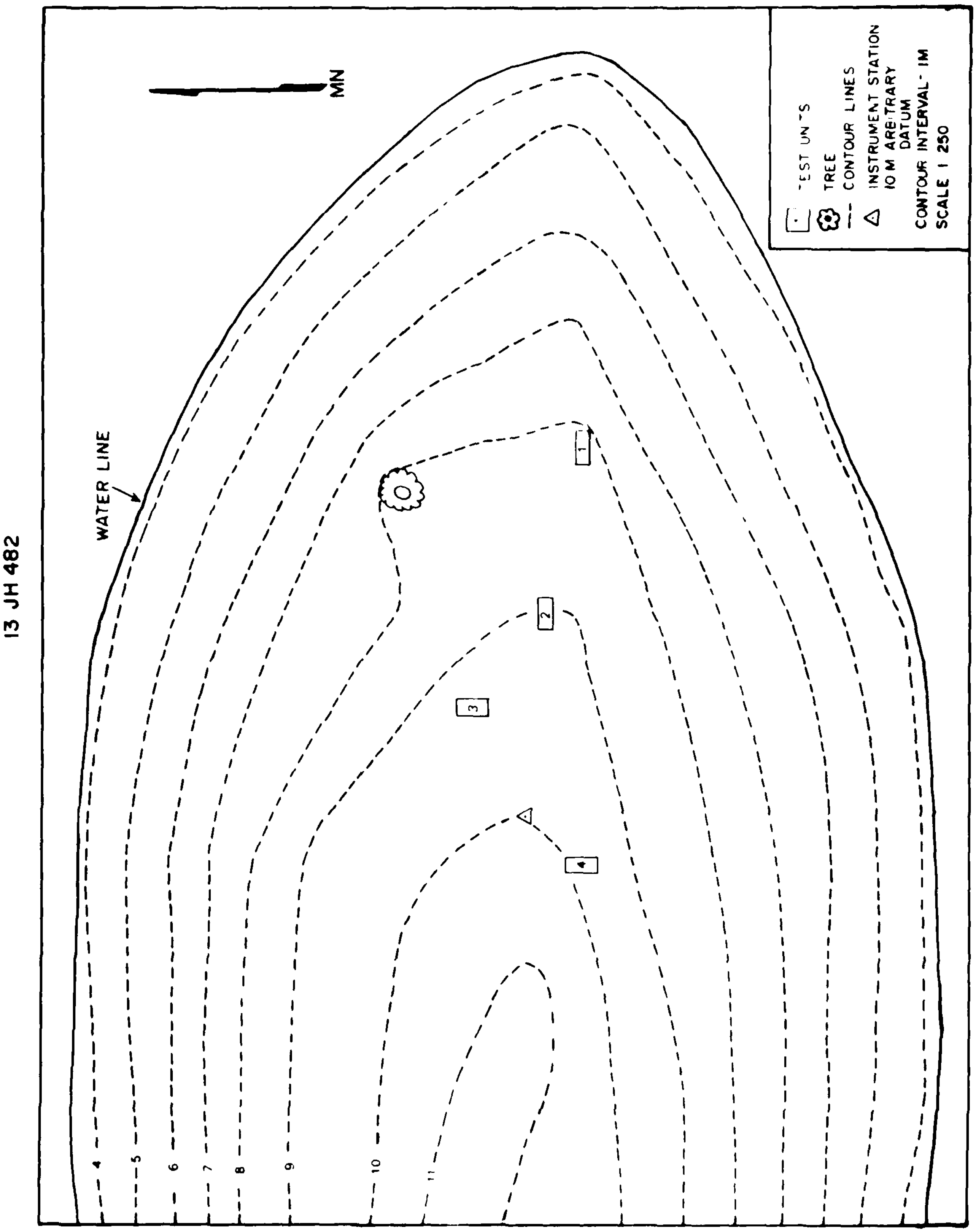


Figure 2: Transit Map, 13 JH 482.

is provided in a subsequent presentation of geomorphic contexts. In this respect, 13 JH 482 was similar to the other excavated shoreline site. In both instances, erosion has removed all recent sediment and exposed sediments at least 100,000 years old. Excavation at these sites as well as observation of the same surface at many of the shoreline sites led to our conclusion that most, if not all of this class of site location is essentially destroyed. The major remnant of sites on these severely eroded landscapes is lithic debitage.

13 JH 485:

A small lithic scatter on an eroded section of shoreline. The site consists of nine pieces of lithic debitage and the base of a small thin triangular point. The point is an indicator of a Late Woodland occupation.

13 JH 489:

Site 13 JH 489 is a small lithic scatter consisting of eleven flakes and a triangular point fragment. The point is made on heat treated chert and appears to be corner notched or stemmed. It is tentatively identified as general Middle or Late Woodland.

13 JH 492:

This site is situated atop a limestone bluff on the shore of Coralville Lake. Although no diagnostic materials were recovered, this site was tested because we felt that it's position would have protected it from the most damaging effects of erosion. Unfortunately, this was not the case. Three units excavated within the limits of the surface collection (Figure 3) resulted in the recovery of two flakes. A single unit placed in an undisturbed area above the maximum flood stage was sterile. Several expanded shovel tests placed on the ridge top above the site were also sterile. Test excavations at 13 JH 492 revealed that the site is destroyed for all intents and purposes.

13 JH 496:

This site is located just above the maximum flood level above the terrace/floodplain of a major inlet formed by Hoosier Creek. Three flakes and a point fragment were collected from a plowed agricultural field. The point fragment is a side notched piece with a broken tip made of white chert. The base is thinned and heavily ground. These attributes are indication of Middle Archaic manufacture. The size of the base indicates that the original piece was somewhat larger. The present size is due to one or more episodes of resharpening.

13 JH 497:

Material from 13 JH 497 was scattered along a long stretch of floodplain/terrace just north of a small stream flowing into Coralville Lake. Approximately 30 lithic items

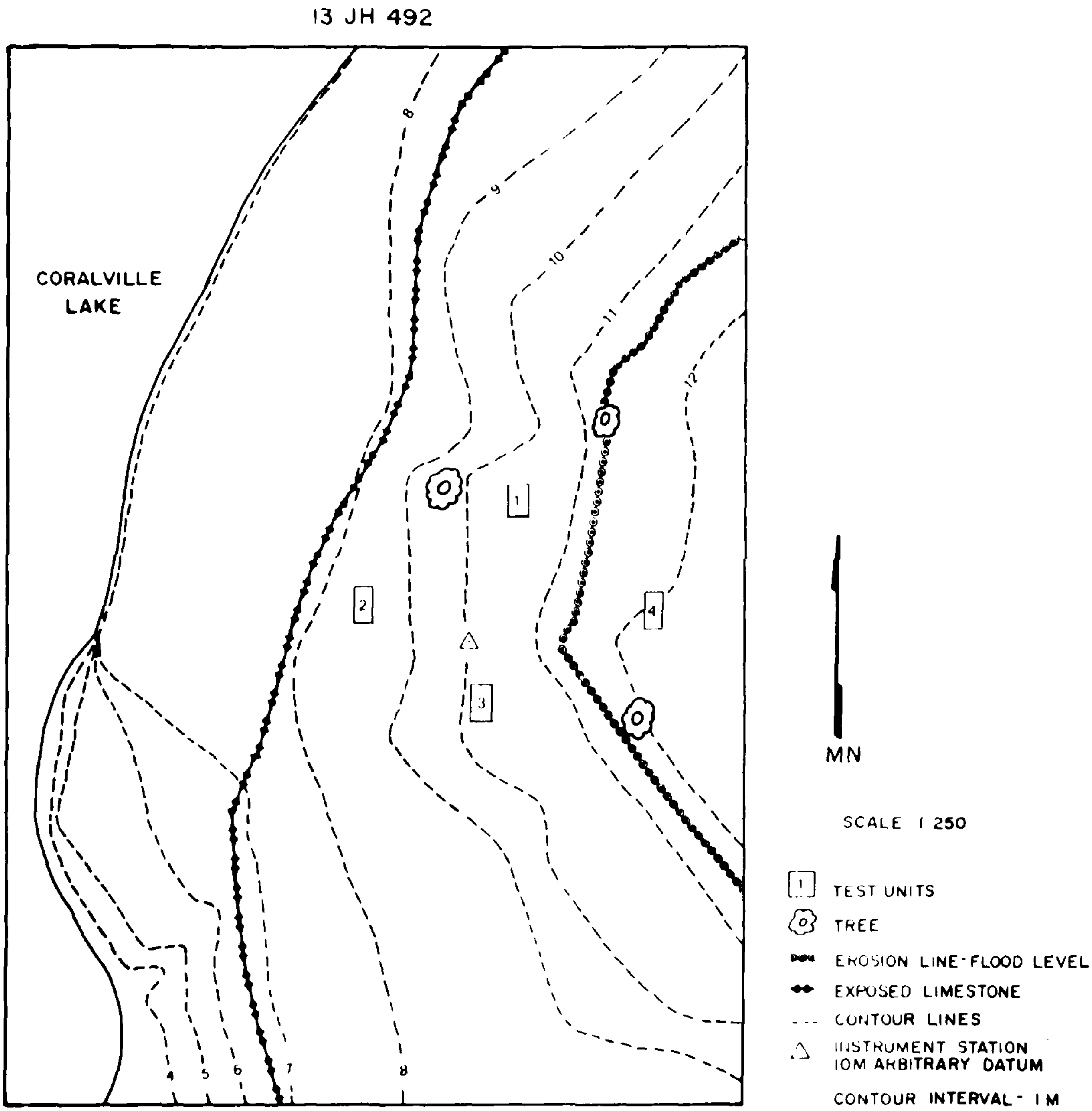


Figure 3: Transit Map, 13 JH 492.

were collected including the base of a small triangular point. The point is a Late Woodland style.

13 JH -7:

This is a spot find consisting of a single piece of angular shatter and a medium sized point. The projectile point is side notched with basal thinning. One corner and most of the base/haft element are broken. Attributes suggest a Middle Archaic affiliation. The single side notch and base fragment are ground. The point is morphologically similar to Big Sandy points. The site was located on the steep eroded shore of a small inlet formed by a stream flowing into Coralville Lake.

13 JH -15:

This site is represented by a surface find located on the eroded shore of an inlet of Coralville Lake formed by several small drainages. A single flake and a small grit tempered body sherd are the only materials recovered. The potsherd derives from a Woodland occupation, possibly Late Woodland.

Sites with diagnostic Artifacts - West of I-380 Bridge:

The number of prehistoric sites located west of the I-380 Bridge is somewhat smaller than the number found east of the bridge. This is in spite of the fact that more area was surveyed west of the bridge (ca. 1200ha surveyed west of the bridge vs. 700ha surveyed east of the I-380 bridge). Only 10 prehistoric sites and spot finds were located in the western section of the project. Two of these sites were reported previously. Of these ten sites, four have diagnostic material and will be discussed below.

Revisited Sites:

13 JH 26:

The Swan Lake site has a long history of visitation and collection by both amateur and professional archaeologists. Surface collections have been made by Anderson (1971), Zalesky (1977), Zieglowsky and Zalesky (1981), and Emerson et al (1984). Each of these successive collections presents a slightly different surface assemblage. All collectors recovered lithic tools and debitage. Anderson notes that collectors have recovered Black Sand Incised, Sister Creek Punctated and Madison Cord Impressed pottery. Zalesky reports collecting shell tempered pottery with tool impressions on interior lips and dentate markings on shoulders. He also recovered grit tempered cordmarked ceramic fragments. The Emerson survey recovered a single body sherd. The G.L.A.R.C. survey collected only lithic debitage and a single biface fragment with a broken tip. Approximately 350 pieces of lithic debitage were collected, covering the entire range of a lithic reduction sequence, but especially the latter stages. That is, the minimal number of primary and secondary decortification flakes would indicate the initial reduction occurred elsewhere, probably at a quarry site or near the source of raw materials.

The biface fragment is a thin medium sized piece probably made on a blade. It can best be characterized as a preform for a point or knife. Although not reminiscent of any distinct point it seems to fit in with the general Woodland designation applied to this site (Zalesky 1977).

The site is located on a sandy terrace and has been badly damaged by wind and water erosion as well as numerous collections. It is listed as having high research potential and is recommended for testing by Zieglowski and Zalesky (1981). However, recent visits by Emerson (1984) and G.L.A.R.C. characterize its condition as poor to bad due to severe erosion.

The Swan Lake site is in a geomorphic setting similar to 13 JH 500. Testing at the latter site demonstrated that it had no subsurface integrity. While we did not test at 13 JH 26, we believe that this site has no subsurface integrity. Between the erosion caused by wind and water and the activity of various collectors, the site has suffered substantial damage. We could not recommend further work at this site. Finally, 13 JH 26 was the only previously reported site we visited which yielded diagnostic material.

New Sites - West of the I-380 Bridge:

13 JH -457:

This site is located on a terrace in the far western portion of the project area. The site consists of a light scatter of material recovered from a relatively large area in a plowed field. The material was found primarily along the northern edge of the field and may extend north of the plowed field into an adjacent woodlot. If this is the case, the site may be undisturbed in the wood lot and would definitely warrant testing.

Material recovered from the site includes two broken biface fragments. One is a small side notched point made on white chert with a broken tip. The point shows basal thinning and is heavily ground along the base and stem. It is similar to Matanzas points and would fit comfortably in a Middle Archaic sequence. The second point fragment consists of the base of a piece produced on mottled red pine chert and is probably heat treated. The piece is corner notched with an expanding stem and exhibits basal thinning with both base and notches ground. It is morphologically similar to Table Rock points and also indicates a Middle Archaic manufacture. On the basis of these points, the site is assigned a Middle Archaic affiliation.

13 JH 500:

This site is located on a sandy terrace between an agricultural field and several bodies of water. The site area and adjacent plowed field have suffered from severe erosion due to water and wind action. Excavation at this site recovered fragments of barbed wire and wire staples. A portion of the site was formerly fenced and probably plowed as part of the agricultural field. The site is currently devoid of vegetation (Fall 1984) and the sediment is predominantly sand.

Surface collection at the site recovered approximately 80 lithic pieces and 50 potsherds. The ceramics are grit tempered and predominantly cordmarked. Twenty-three pieces have one or both faces eroded away. A single rimsherd was recovered. Ceramics as a whole can be placed in a general Linn Ware category. However, because of the small and generally deteriorated condition of the sample, this is somewhat tentative.

Lithics cover the manufacturing spectrum with an emphasis on later stages. Comments made on the lithics at 13 JH 26 would also apply here. The lithic collection includes three small thin triangular points. The points are morphologically dissimilar but all fall into a general Late Woodland category. Based on the surface materials, the site would be classified as a Late Middle Woodland/Late Woodland occupation. Function is less certain but a small, relatively long term or repeated short term habitation may be suggested.

This site was subjected to test excavations. Four 1 x 2m test units (Figure 4) were placed selectively on the site. Locations were selected in part by density of surface material, but also in an attempt to locate site limits. A total of 18 pieces of lithic debitage and 14 additional potsherds were recovered. No material was located in Unit #4. Prehistoric material was recovered from as deep as 60cm below the present surface, but a nail was recovered from 40 cm below surface as well. The subsurface structure of the site did not indicate that subsurface integrity was possible. We conclude that the historic and prehistoric materials found below the surface were located there due to a variety of soil turbation processes.

The present site might best be considered a site remnant. Indeed this is probably the case with 13 JH 26 and all other exposed, eroded sites at Coralville.

13 JH -6:

A single biface with a broken base is the only item recovered in a large plowed agricultural field on a level terrace. It is difficult to definitely identify the point because of the broken base, but it seems to fall into a general Late Woodland classification. The point is made of a white chert with brown mottles. The tip and base have both been damaged with the entire haft element snapped off. The piece is corner notched. Aside from the probable Late

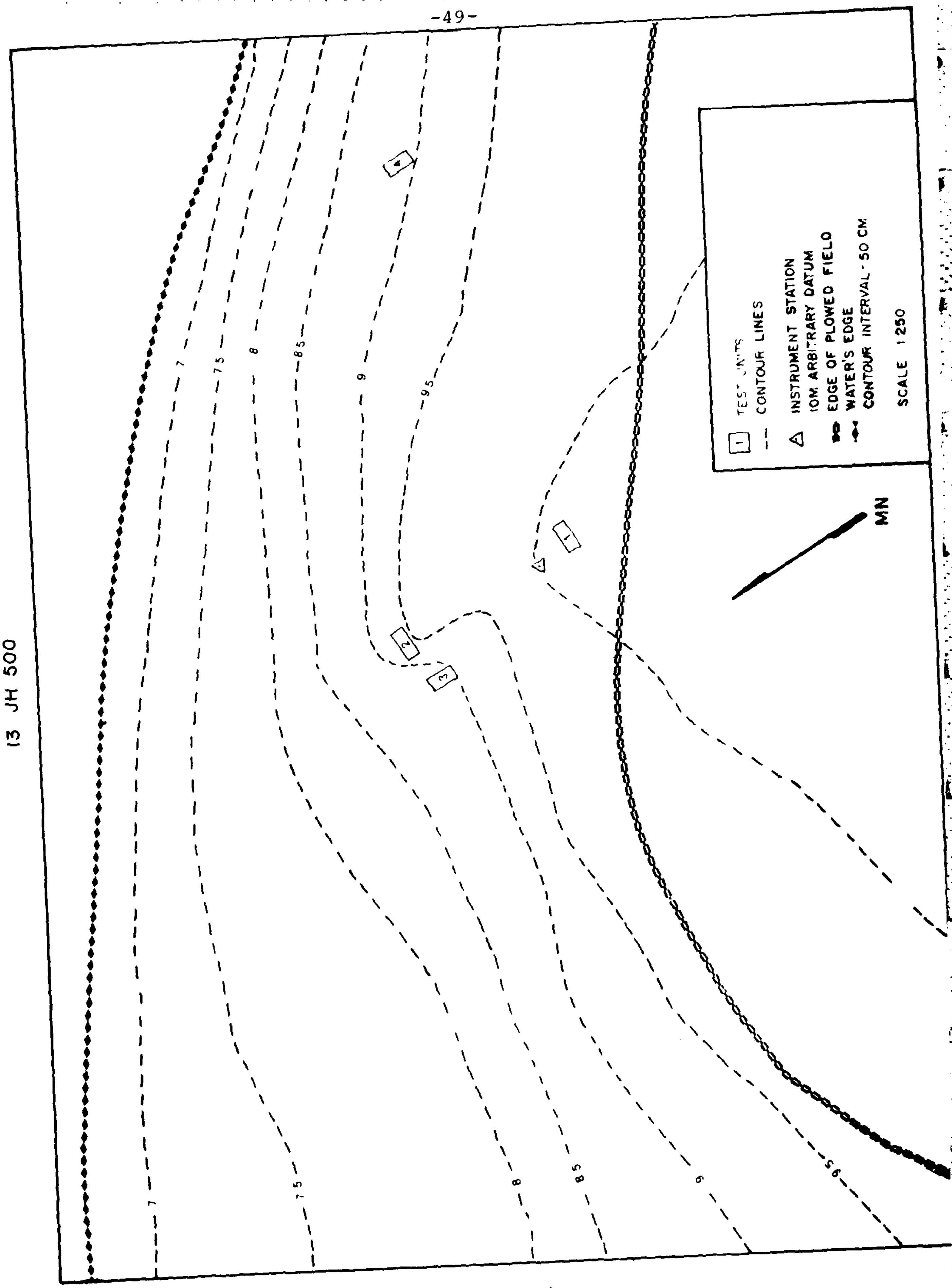


Figure 4: Transit Map, 13 JH 500.

Woodland identification, no other information is available for this spot find.

SURVEY SUMMARY:

The location and condition of sites recorded during the MPI survey provide a sound basis for continued management efforts at Coralville Lake. Most of the sites from eroded contexts should be considered lost to the resource base. A few of these sites might be profitably investigated in order to further document the lack of integrity.

Several types of landscapes were identified as the most promising potential localities for encountering intact sites and these should be the focus of further archaeological research. East of the I-380 Bridge, along the main lake are numerous small tributary streams with associated inlets and valleys. These tributary valleys are the only landforms east of the I-380 Bridge that we would recommend for further survey. These valleys are subject to alluvial and colluvial deposition depending on their geomorphological characteristics. The sediment buildup would require some type of subsurface testing. One alternative is to carryout close interval shovel testing on all or a sample of these valleys. Another technique calls for random 1 x 2m test excavations in favorable portions of the valleys. A mandatory precursor to either technique would be soil probe coring of the small valleys to determine the depth to stable buried surfaces. A combination of all three techniques will yield informative results.

West of the I-380 Bridge are several landforms worth investigating. Terrace edges, alluvial fans, the shore of sloughs and oxbow lakes as well as the low terrace/floodplain complex of the Iowa River. A distinct problem of the areas near to the current river channel is that the vast majority of this land was under water during our survey. Adequate investigation of the active floodplain and land around sloughs and oxbows will require a low water stage of at least several weeks duration. Terrace edges, tributary valleys and alluvial fans some distance from the present river may be investigated during "normal" pool levels. These landforms will require one or more subsurface testing techniques in order to identify buried surfaces and subsequent examination for archaeological sites.

It is strongly recommended that any further archaeological work at Coralville be carried out in conjunction with geomorphological investigations. The landscape west of the I-380 Bridge in particular is extremely complex. An understanding of the evolution of these landscapes is essential for an adequate assessment of the archaeological resources in Coralville Reservoir.

Some tentative general comments are possible for the Coralville sites as a whole. In terms of prehistoric occupation, it would appear that the project area was most intensively occupied during the Woodland period, with a slight emphasis on Late Woodland. The 198 previously reported sites were listed as 132 indeterminate affiliation, 14 Late Woodland, 9 generalized Woodland sites, and one each Early and Late Woodland. In addition, 15 multicomponent sites had Woodland components; 4 Early, 5 Middle, 5 Late and 2 general Woodland. The new sites located during the recent survey include five general Woodland, and three each Middle and Late Woodland. Assuring the legitimacy of these cultural affiliations for the moment, the cultural affiliation of all components reported at Coralville is presented in Table 7.

In light of the vast number of indeterminate affiliations and the eroded nature of most of these sites, additional comments on temporal/cultural affiliations are merely speculation.

Previous discussion sums up our opinion of the functional assessment of the entire group of sites and further commentary would be redundant.

Lithic analysis of the assemblage collected during the survey allows the following general comments. A chert we have referred to as grey nodular chert was widely utilized and apparently locally available. It is found in relatively flat nodules in the local limestone outcrops. The nodules have a limestone cortex covering a medium quality grey chert and often thin enough that bifaces may be manufactured by grinding the flat surfaces and knapping the edges into rough and final form. Two of the points we found were made using this technique. Both had limestone cortex visible on their dorsal and ventral surfaces. Numerous biface preforms were found which consisted of the nodular chert with the cortex trimmed. Virtually all sites we located had at least some examples of the grey nodular chert.

Heat treatment or alteration was also relatively common at Coralville. Heat alteration often improves the knapping characteristics of poorer grades of chert. The grey nodular chert was often found in a heat treated variety, as were other unnamed types of chert. The range of heat treated debitage found indicates that this modification could occur at virtually any stage of the manufacturing process.

Given the condition of the sites, no other meaningful characterizations can be made for the Coralville assemblages taken as a whole.

A possible avenue for further exploitation of the reported sites and associated material exists. In light of the repeated known collections on most sites east of the I-380 Bridge, the material from the sites is scattered in several repositories, and many are in private collectors. The undocumented collections likely to have occurred on many of those sites have further fragmented the artifact assemblages. If one were interested in exploring site function and identification, it may be possible to gather all materials from the documented sites. Since collectors often favor diagnostic items, a greater understanding of the temporal/cultural affiliation and site function would be possible with additional diagnostic artifacts.

TABLE 7: CORALVILLE SITE DISTRIBUTION

By Geomorphic Unit - Components		
Floodplain, Iowa River		Total Sites - 25, 12.6%
Indeterminate	15	
PaleoIndian	1	
General Archaic	5	
Early Archaic	1	Components - 12.7%
Middle Archaic	1	
Late Archaic	1	
General Woodland	2	
Early Woodland	3	
Middle Woodland	2	
Late Woodland	6	
Historic	1	
Mound	1	
	39	
Floodplain, Tributary Stream		Total Sites - 5, 2.5%
Indeterminate	3	
General Archaic	1	
General Woodland	1	
Early Woodland	1	Components - 2.0%
	6	
Caldwell limestone cave sites on small Tributary valleys		Total Sites - 3, 1.5%
Indeterminate	2	
General Archaic	1	
Early Woodland	1	Components - 1.6%
	5	
Southern Iowa Drift Plain, Interfluve		Total Sites - 31, 15.6%
Indeterminate	45	
General Archaic	3	
General Woodland	10	
Early Woodland	3	
Middle Woodland	4	Components - 24.5%
Late Woodland	7	
Mound Sites	2	
Oneota	1	
	75	

TABLE 7: (Continued)

Southern Iowa Drift Plain, high lying ridge tops		Total Sites - 9, 4.5%
Indeterminate	7	
General Archaic	1	
General Woodland	2	
Mound Sites	2	Components - 3.9%
	12	
Southern Iowa Drift Plain, hillside, valley slope and steep hillside		Total Sites - 43, 21.7%
Indeterminate	32	
General Archaic	3	
General Woodland	6	
Early Woodland	1	Components - 17.3%
Middle Woodland	3	
Late Woodland	8	
	53	
Terrace with thick mantle of loess		Total Sites - 60, 30.3%
Indeterminate	33	
General Archaic	13	
General Woodland	6	
Early Woodland	7	
Middle Woodland	8	Components - 29.1%
Late Woodland	17	
Historic	5	
	89	
Terrace, lacking mantle of loess, savannah and prairie soils		Total Sites - 14, 7.0%
Indeterminate	11	
Early Woodland	1	
Middle Woodland	3	
Late Woodland	2	Components - 6.2%
Historic	2	
	19	
Iowan surface, forest soils in thick aeolian sediment		Total Sites - 6, 3.0%
Indeterminate	4	
Late Woodland	2	Components - 2.0%
	6	
Altered Land		Total Sites - 2, 0.1%
Indeterminate	1	
General Archaic	1	Components - 0.6%
	2	

(Total Components - 306 Total Sites - 198)

The above procedure is not necessarily recommended for Coralville. It is presented as perhaps the most viable research which would yield results and aid in interpretation of the body of known sites in the Coralville project area. Such an endeaver, however, is given a very low priority.

We do strongly recommend a joint geomorphological/archaeological examination of landforms in the western portion of the project area and appropriate landforms east of the I-380 Bridge not destroyed by erosion. The primary goals of such a project are to: 1) develop an accurate description of landform evolution, 2) identify surfaces likely to have been stable and favorable for occupation in the past, and 3) examine these surfaces for archaeological sites.

This type of investigation will not yield the quantity of sites located by surveying the eroded landscapes. However, the sites located using this approach will be found in undisturbed contexts and have the potential to yield significantly more information than the eroded sites.

SURFICIAL GEOLOGY OF CORALVILLE LAKE:

Introduction: This narrative provides supplemental data not presented by Emerson et al (1984). In order for evaluation an overview of the geology and paleoclimatology is presented. Subsequent to presentation of the overview, various site contexts are evaluated. In addition, site-specific studies are presented. Finally, recommendations for further detailed studies are reviewed.

Quaternary History:

Underlying bedrock units:

Beneath the deposits associated with Pleistocene glaciation lie carbonate bedrock of primarily Devonian age. The oldest rock units are observed in the northeastern corner of Johnson county and are Silurian age, while progressively younger units are exposed along a transect from northeast to southwest across the county.

In the Coralville reservoir area the underlying bedrock is primarily of the Devonian System. The Middle Devonian units belong to the Wapsipinicon Formation of crystalline limestone, dolomite, sandy shale, argillaceous limestone and crystalline dolomitic limestone (Hershey, 1969). The younger units of the Cedar Valley Limestone group are seen in many of the bedrock exposures in the Coralville Lake area. These units are composed of crystalline and clastic limestone, dolomitic limestone with coral, and fossiliferous limestone.

The Upper Devonian series including the Lime Creek and Shell Rock Formations consisting of fossiliferous limestone, fossiliferous gray shale, and massive limestone and dolomite, can also be observed in portions of the Lake MacBride and Coralville reservoir areas. Further away from the reservoir in the southwestern part of the county Upper Devonian shales, dolomites, and siltstones of the Yellow Spring Group are exposed.

The Pleistocene:

Considerable debate ensued regarding the glacial history of the early Pleistocene in east central Iowa. Classically, two major glacial stages were considered since only two tills were recognized. These older tills represented deposits from glacial advances during the Nebraskan, and Kansan stages (Leighton, 1916, Alden and Leighton, 1917, Cable, 1921). However, more recent study indicates that multiple tills exist and represent a number of glacial advances during the early Pleistocene.

Most of the older studies recognized a post Illinoian deposit which was primarily composed of a gravel lag or pebble band. This band was considered to be the Iowan drift which was overlying much older Kansan till (Alden and Leighton, 1915). The presence of the Iowan drift remained unquestioned for several decades, but by the 1950's doubts were being raised about its existence.

Studies conducted on pahas in the east central Iowa refuted the earlier claims of an Iowan drift. A paha is an erosion remnant of an older land surface standing above the Iowan erosion surface at interstream divides (Ruhe, 1969). These topographically higher landforms are linear and generally are aligned in a northwest to southeast orientation. In the Coralville area, a paha ridge is identified just to the east of Solon (Prior, 1976).

Transects across several pahas and onto the lower Iowan surface suggest that the pebble band is not a thin veneer of till. A number of investigators have demonstrated that the formerly called Iowan drift is actually an erosion surface (Ruhe et al., 1965, Ruhe et al., 1968, Vreeken, 1975, Hallberg et al., 1978, Hallberg, 1980). These more recent studies have provided convincing evidence precluding the existence of Iowan drift. The stratigraphic units occurring in the pahas show multiple tills separated by paleosols and undifferentiated alluvial deposits. The pahas contain the most complete Pleistocene record in northeastern Iowa but do not contain the pebble band formerly believed to be Iowan drift. The pahas correlate stratigraphically with the pre-Illinoian (formerly Kansan) surface seen in southern Iowa by showing resemblance to those units observed further to the south.

A typical stratigraphic column through the top of a paha would show a surface soil developed in thick Wisconsinan eolian silt and sand. Beneath the loess would be a basal paleosol of Late Sangamon or Yarmouth-Sangamon age. Below the paleosol would be till and alluvial deposits considered pre-Illinoian (formerly Kansan and Nebraskan) in age.

These pre-Illinoian deposits have been recently evaluated by Hallberg (1980), and consist of multiple units of till, stratified alluvial sediments, and organic enriched horizons. The youngest of the pre-Illinoian (formerly Kansan) tills belong to the Wolf Creek Formation and consist of the youngest Hickory Hills, the Aurora, and the oldest Winthrop members. The oldest of the pre-Illinoian (formerly Nebraskan) deposits belong to the Alburnett Formation. These deposits lie below the Wolf Creek Formation and consist of undifferentiated tills, paleosols, and alluvial sediments (Figures 5-6).

Two well developed paleosols are recognized in the pre-Illinoian deposits. The Dysart paleosol is developed in the Aurora till subjacent to the Hickory Hills member. The Westburg paleosol is developed in the uppermost till of the Alburnett Formation. Other weakly developed undifferentiated paleosols are observed in both the Wolf Creek and Alburnett Formations.

During the Wisconsinan the Iowan erosion surface was being developed in northeastern Iowa. This surface was

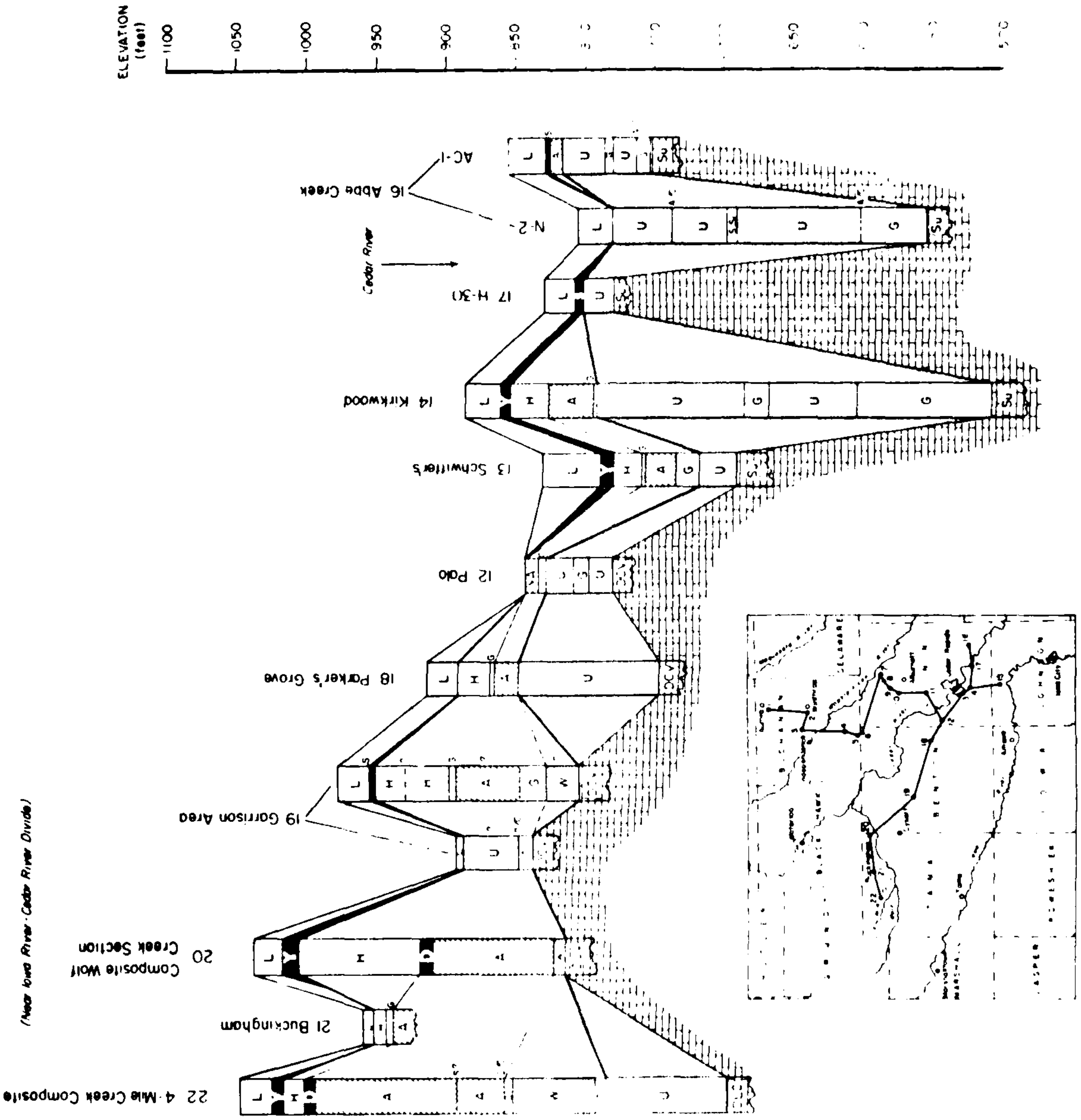


Figure 5: Schematic east-west cross-section through Eastern Iowa. (From Hallberg, 1980).

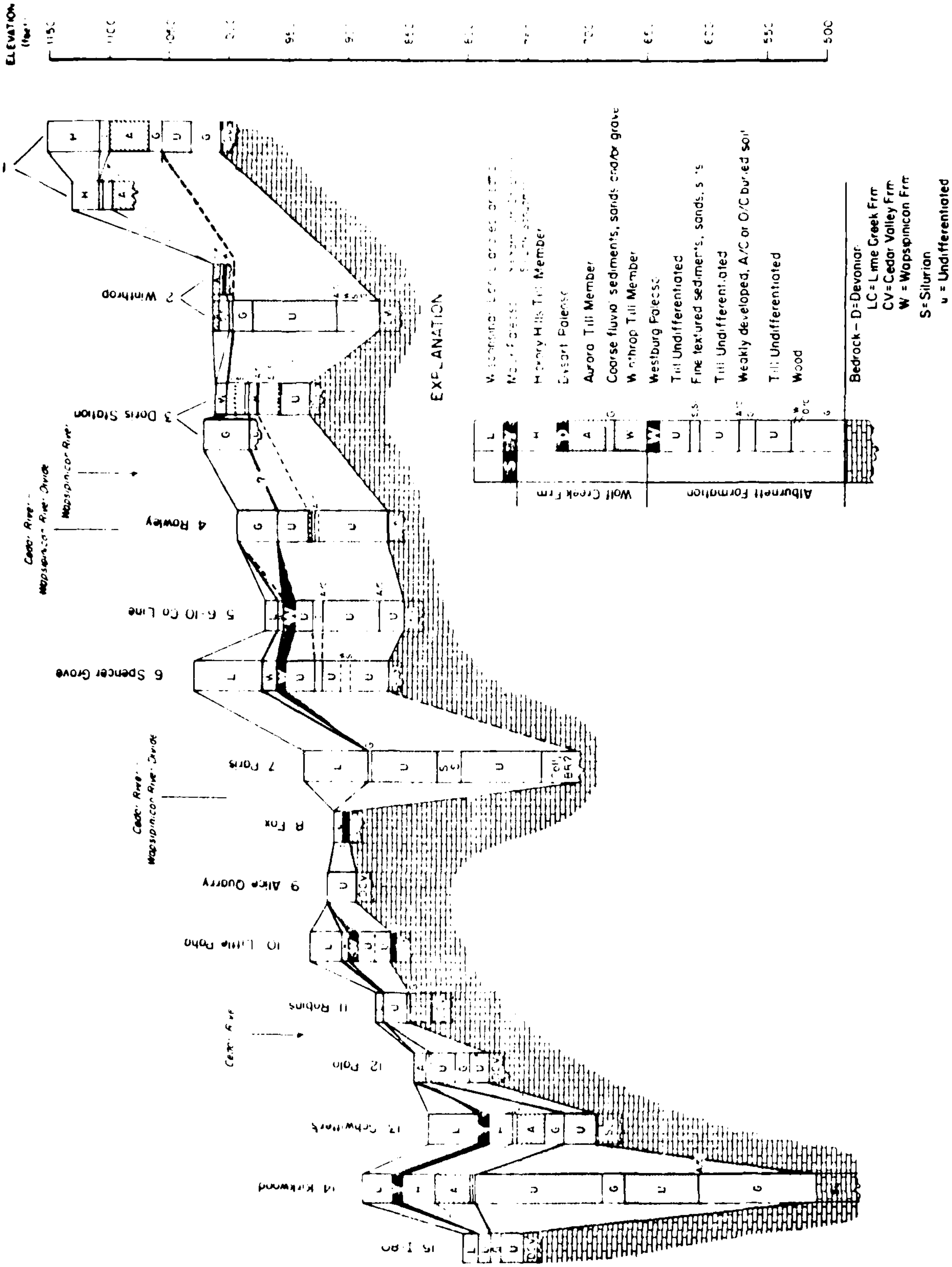


Figure 6: Schematic north-south cross-section through Eastern Iowa. (From Hallberg, 1980).

being cut while loess was being deposited in the region. Unlike the more complete stratigraphic record observed in the paha inliers, the Iowan surface which is capped by Wisconsinan loess truncates older paleosols and till. This is observed near Geneseo Iowa, where the Iowan surface abutting Hayward's paha truncates the Yarmouth-Sangamon paleosol, the subjacent till, the Aftonian paleosol and the Nebraskan till (Ruhe et al., 1968).

The Iowan surface presumably formed from episodes of fluvial erosion and concomitant eolian deposition which began during the Farmdalian about 30,000 B.P. and extended through the Woodfordian. However after the last increment of loessal deposition occurred about 14,000 B.P., components of the Iowan surface continued well into the Holocene (Ruhe et al., 1968).

The Holocene:

Climatic history:

Atmospheric circulation patterns were greatly affected by the wasting of Laurentide ice to the north of east central Iowa. The early Holocene brought about the persistence of an upper atmospheric circulation pattern dominated by a cool relatively dry northwesterly flow out of Canada (Knox, 1983). Maritime tropical air masses derived from the Gulf of Mexico were effectively blocked by the persistent northwesterly component.

As the Laurentide ice mass wasted further to the north, a more westerly upper atmospheric component penetrated into the upper midwest. This intrusion of Pacific derived air continued to block the maritime tropical air to the south. Hence, the middle Holocene was characterized by warmer dryer conditions, which effectively lowered local water tables and destabilized vegetation. From 9500 to 4700 B.P. in east central Minnesota there was an increase in the duration of Pacific air producing a 2 inch decrease in precipitation during the maximum penetration of westerly air about 7200 B.P. (Webb and Bryson, 1972).

Holocene climatic changes occurring in the upper midwest have produced a migration and succession of several plant species (Webb, Cushing, and Wright, 1983, Wright 1976). The early Holocene advance and later retreat of ecotones suggest changes in the dominant upper atmospheric circulation regimes. The zonal upper atmospheric circulation pattern increased the frequency of warm dry Pacific derived air masses, causing the prairie/forest ecotone to advanced eastward across Iowa prior to 8000 B.P. The waning of Laurentide ice continued during the middle Holocene and by 6500 B.P. the ice had retreated to the Quebec/-Labrador plateau. In response to the deteriorating ice mass, the dominant westerly atmospheric component became less persistent in the upper midwest. As a result the influx of maritime tropical air from the Gulf of Mexico and polar air from Canada began to increase in frequency.

The shift in dominant upper air patterns occurred rapidly between 6000 and 5000 B.P., changing the frequency of air mass dominance toward a more persistent meridional upper atmospheric circulation. Meridional circulation patterns provide the mechanism necessary for the mixing of unlike tropical and polar air which results in an increase in the frequency and magnitude of precipitation events (Knox, 1975).

The late Holocene climate including contemporary twentieth century climate, is characterized by persistent episodes of either meridional of zonal circulation. The orientation of the upper air jet stream over the upper midwest determines whether the prevailing climate will be relatively cool/moist, cool/dry, warm/moist, or warm/dry (Knox, 1979). Persistence of any one of these climatic scenarios can change the magnitude and direction of geomorphic processes controlling landscape evolution.

Geomorphic episodes:

Geomorphic responses found in alluvial chronologies are strongly affected by the magnitude and direction of Holocene climatic changes. Alluvial chronologies imply that a shift to drier conditions promote hillslope erosion, while a shift to wetter conditions institutes hillslope stability and valley incision (Knox, 1984). Whether the geomorphic response is aggradation or degradation apparently depends upon the direction of climatic shift relative to the existing climate, and on the relative location of stream reach within the drainage net hierarchy (Knox, 1972). Spatially this suggests that in a relatively large watershed perhaps a 6th order basin (Strahler ordering method), a shift in climate may produce different geomorphic responses in the headwater as opposed to the middle and lower reaches.

One of the reasons for the apparent episodic behavior in landscape evolution is the lag time produced when vegetation is out of balance with a new climatic regime. A shift in dominant upper air patterns which occurred rapidly between 6000 and 5000 B.P., produced a condition where the established vegetation was not adjusted to the new more moist climatic regime. The lag time involving at least 100 years in the adjustment of vegetation (Wendland and Bryson, 1974), produced a biogeomorphic response which initiated lateral reworking of alluvial floodplains particularly in southwestern Wisconsin (Knox, 1972, 1976).

Although external (extrinsic) climatic factors often produce episodes of hillslope and/or valley instability, intrinsic factors that periodically exceed thresholds of slope stability will also initiate episodic geomorphic behavior. Trenching of alluvial fans are common, and as a fan develops it steepens finally exceeding a threshold slope where incision begins to occur (Schumm, 1973). Likewise, sediment storage in a valley occurs through time aggrading the valley slope until oversteepening produces degradation.

These are types of intrinsic geomorphic thresholds which produce landform change through time to a condition of incipient instability without a change of external (ie. climatic) influences (Schumm, 1973, 1977:8).

During the early Holocene valley alluviation including alluvial fan development appears to have been proceeding (Knox, 1972, 1976) in many parts of the midwest. Evidence from Sumner Bog, Bremer county (VanZant, and Hallberg, 1976), suggests that organic enriched valley fill deposits were accumulating on a sandy Woodfordian terrace during the early Holocene. However, increased aridity associated with the middle Holocene likely changed both vegetation type and density promoting surficial instability. Radiocarbon dates recovered from the bog indicate that the period of maximum dryness occurred between 7,200 and 6,200 B.P. This resulted in the lowering of local water tables which oxidized organic material and produced incision. The evidence for an episode of erosion was illustrated by an unconformable surface which was later buried by peaty sediments beginning around 6,100 B.P.

Between 6,000 and 4,500 B.P. valley floor sediments were being eroded and reworked through rapid lateral channel migration in western Wisconsin. This fluvial activity decreased from 4,500 to 3,000 B.P. but again intensified after 3,000 B.P. (Knox, 1984). By 1,800 B.P. alluvial valleys in western Wisconsin again stabilized in favor of modest vertical accretion (Figure 7).

In Tama county Iowa, the Thoms basin first reveals a history of valley entrenchment in the form of gullies during the early to mid Holocene. By about 6200 B.P. slope wash deposits began to fill the valley bottom gullies (Vreeken, 1975). Valley alluviation proceeded throughout the remainder of the Holocene in the Thoms basin until recently when agricultural land use has promoted an episode of destabilization.

Coralville Site Characteristics:

The Coralville area lies within the Iowan erosion surface (Figure 8), and the pre-Illinoian drift region (Ruhe and Prior, 1970, Prior, 1976). Both surfaces are capped by Wisconsinan loess. Older pre-Holocene alluvial terrace surfaces that date prior the 14,000 B.P. are also capped by loess. Younger alluvial surfaces of Holocene age are found closer to the Iowa river course.

To the east and south of interstate 380, the Iowa river valley is confined to a bedrock gorge of presumably post-Kansan age (Leighton, 1916, Salisbury et al., 1968). Upstream and to the west of the interstate the valley widens and passes through a region of unconsolidated pre-Illinoian drift (Salisbury et al., 1968). Within the relatively wide valley, Wisconsinan age eolian dunes can be observed (Finney, 1984).

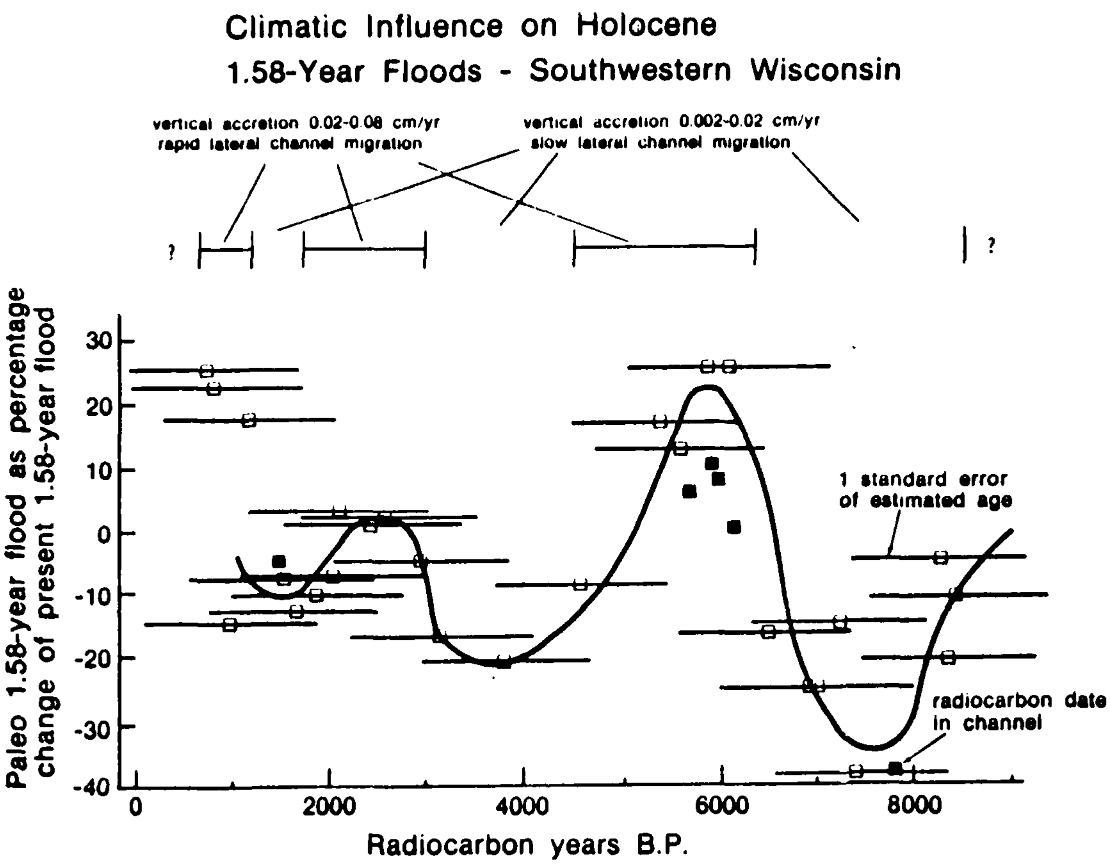


Figure 7 . Holocene variation in the magnitude of the mean annual (1.58-year) floods in western Wisconsin expressed as a percentage larger or smaller than the modern mean annual floods. (From Knox, 1984)

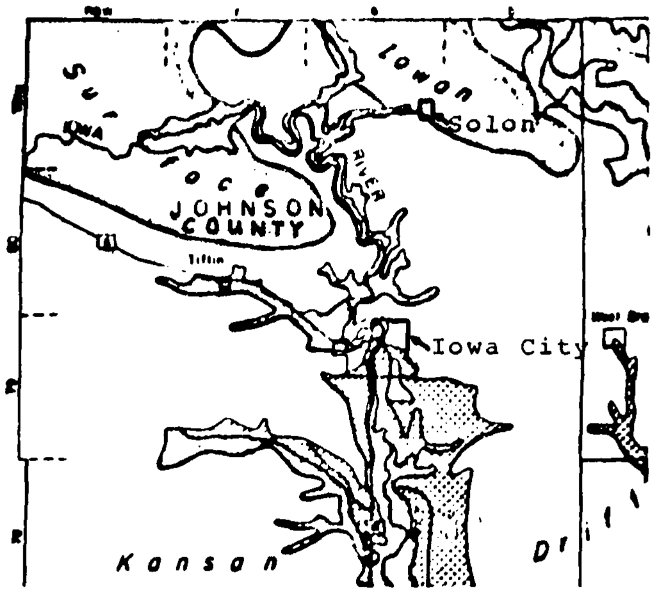


Figure 8 . Illustration showing the Iowan surface and the pre-Illinoian "Kansan" drift plain. (adapted from Ruhe and Prior, 1970)

The climate of the Coralville area would be considered humid continental with cold winters dominated by continental polar air masses and warm summers dominated by maritime polar (Pacific) and maritime tropical air masses. The summer average temperature is 73 degrees F. and the average winter temperature is 24 degrees F. Total annual rainfall is about 34 inches with 70 percent of the precipitation occurring between the months of April and September (Schermerhorn, 1983).

Most of the soils in the Coralville area are developed in loess with dark organic rich surface horizons and subsurface argillic horizons. Many of the soils would be classified as Udolls and Udalfs, particularly in the upland areas. However, in areas closer to the Iowa river course soils have formed in coarser textured alluvial and eolian sediments and have rather poorly developed subsurface horizons. Many of these soils trend toward Fluvent and Psamment suborder classification.

Previous investigation:

A study of the Coralville Reservoir area by Emerson (1983), examined several geomorphic surfaces contained within the reservoir area. From a number of boreholes and soil survey studies, delineation of a number of "physical environments" were mapped surrounding the Coralville reservoir (Emerson, 1983: 17). These mapped units were particularly concerned with surfaces located above the main Iowa river valley therefore excluding the modern floodplain, low Holocene terraces, alluvial fans and colluvial footslopes abutting the main valley. Lower Holocene terrace and modern floodplain surfaces adjacent to the Iowa river course are often impounded throughout much of the year, and were simply mapped as floodplain in this former study.

The Floodplain:

Considerable discussion and often confusion surrounds the concept of the "floodplain". This is primarily due to the differences in definition used by investigators of different disciplines or concerns. Engineers and land use planners usually refer to any area that is subject to flooding (Dunne and Leopold, 1978: 428) as the floodplain. This would include areas adjacent the river course that would be flooded only during rare hydrologic events. For example, a 50 year (2% recurrence probability per year) flood event would be considered as part of the floodplain to the land use planner.

In constrast, the floodplain to the geomorphologist consists of that area adjacent the river course which is inundated frequently in response to the present hydrologic regime. The floodplain in this sense is actively being reworked and constitutes that area which is presently under construction. The floodplain under construction is flooded frequently and at a relatively consistent recurrence interval of 1.5 years in the annual duration flood series (Dunne and Leopold, 1978: 607) and 1.0 years in the partial duration flood series. In the field the floodplain under construction is marked by the top of the fining-upward lateral accretion point bar deposit (Knox, 1984). Consequently, the floodplain to the geomorphologist constitutes a much smaller area and does not include slightly higher alluvial surfaces abutting the modern floodplain surface.

Alluvial valleys often contain multiple relict surfaces that relate to past hydrologic regimes, and in many cases these surfaces show only small topographic changes that are perceptible only through field observations. These more subdued terrace surfaces should be of particular concern to the archaeologist since they may contain preserved buried surfaces of considerable cultural significance.

Preliminary Site Investigations:

13 JH 500 (Swisher 107):

This site which is located adjacent Hawkeye Wildlife Refuge shows evidence for considerable surficial reworking (Figure 9). The cultural material observed either at or near the surface constitute a lag deposit which has accumulated due to severe surface erosion. Little evidence remains of an organic enriched A horizon which has been oxidized and eroded through intensive agricultural land use. The well sorted sands and their concomitant rapid infiltration capacities constitute the parent material seen at the Swisher site. The rapid infiltration promotes drought conditions and inhibits surface vegetation. As a result the surface is highly unstable and is subject to frequent episodes of reworking.

Since this site is inundated during the spring, the surface is subject to alluvial cut and fill episodes. However after the annual high magnitude spring flows are attenuated, the surface is subjected to eolian reworking. Evidence that both eolian and fluvial processes are currently active at the site was seen in the form of surface flood debris, and in the form of small scale dunes parallel to the winter wheat rows in the adjacent field.

Unit 2 provided the most complete profile observed at 13 JH 500. There was a generally coarsening in texture from the surface to the base of the excavated unit. A silt probe core extended the profile from the bottom of the excavation unit (120cm.) to 415cm. Clay enrichment in the form of lamellae began about 65cm. below the surface and continued to 235cm. As the clay fraction decreased, overall texture began to increase. Granules and pebbles were observed beginning at 385cm. and continued to the bottom of the profile at 415cm. The entire profile was leached of carbonates.

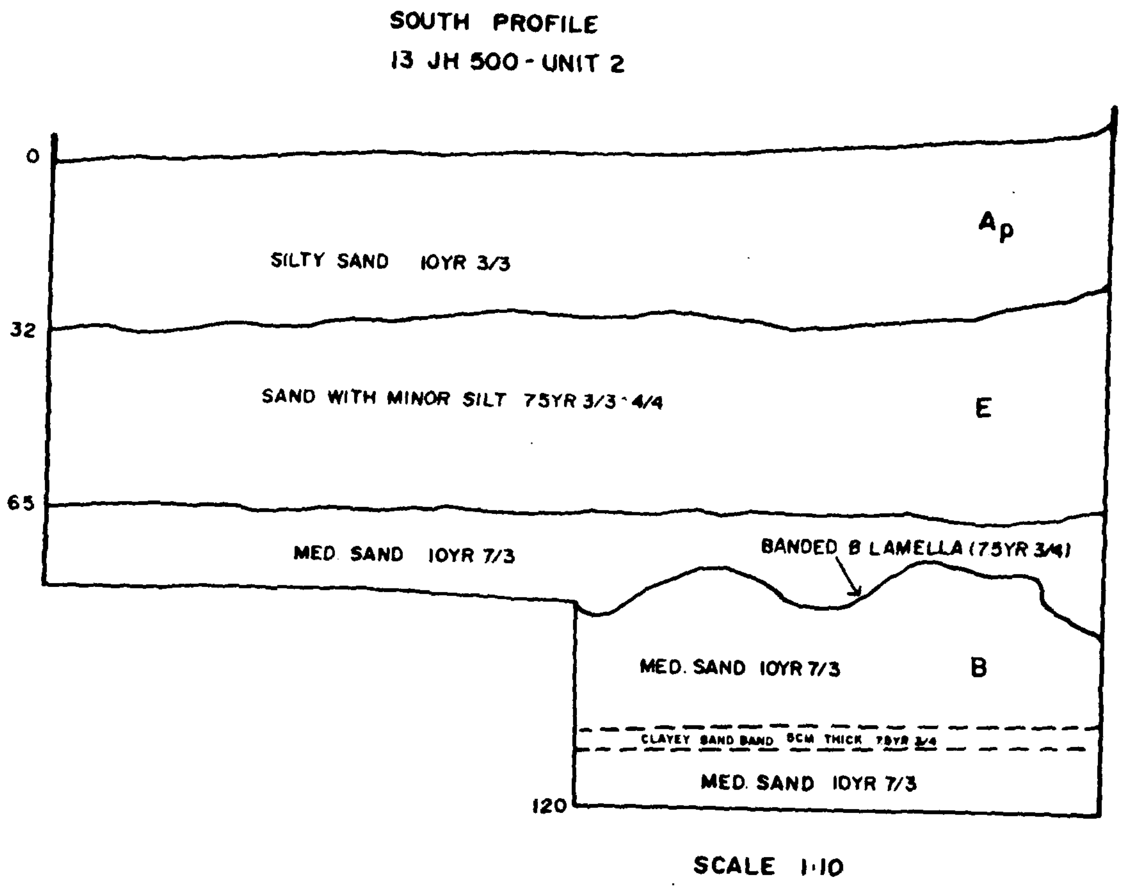


Figure 9: Stratigraphy at 13 JH 500.

Particularly characteristic of coarse textured soils is a banded B horizon. Due to a lack of fine grained material, subsurface illuvial horizons will develop lamellae varying in thickness from less than 1mm. to several centimeters. Subsurface lamellae observed at a Mississippi river terrace (Overstreet, 1984b) found late Archaic material stratigraphically above these textural lamellae. The time necessary to develop subsurface lamellae varies, however Berg (1984) showed that these bands required a few thousand years to develop in sand dunes along Lake Michigan. The origin of these bands may not be entirely pedogenic. Dijkerman et al. (1967), suggests that these bands may result from both alluvial and pedogenic processes. If an alluvial sequence of coarse grained deposits are interrupted by an episode of fine grained deposition the fine grained deposit may act to impede subsequent downward clay migration and promote illuviation.

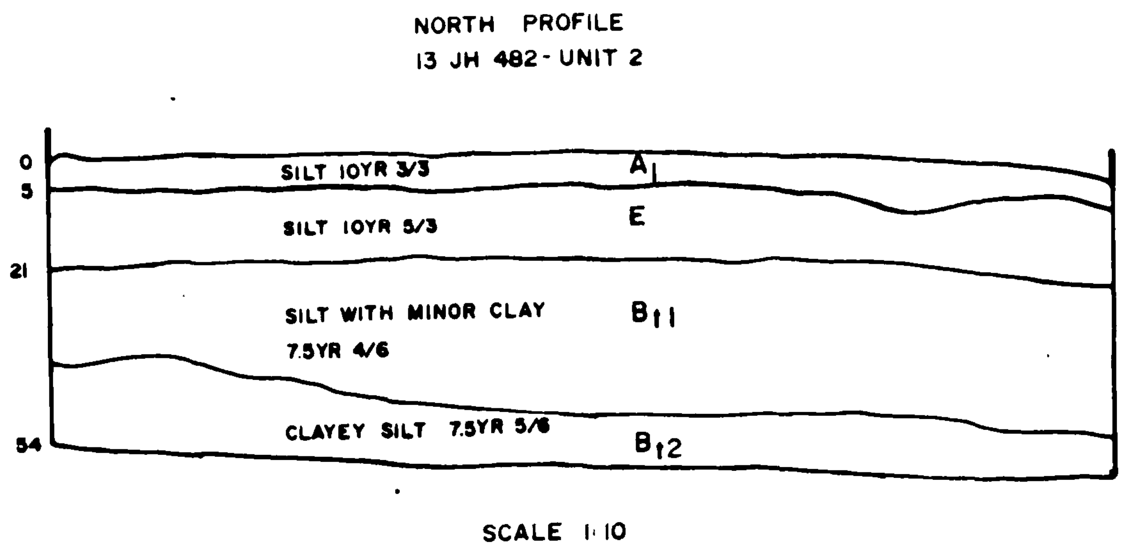
From the observations made at Unit 2, this site is likely developed in leached reworked outwash sediments that have been mobilized during the Holocene. Lateral migration and subsequent downcutting of the Iowa river has produced a terrace composed of lateral accretion point bar deposits characterized by a fining upward sequence grading from pebbly sand at the base, to medium sand, and finally to silty sand at the top. Due to the highly mobile nature of the surficial sediments, erosion has concentrated cultural material at or near the surface as a lag component.

13 JH 482:

13 JH 482 is a site located on a spur which dips to the southeast toward the Iowa river from the main northeast-southwest trending ridge (Figure 10). This site is positioned on the Southern Iowa drift plain which is composed of Wisconsinan loess overlying pre-Illinoian till and carbonate bedrock.

This site has experienced severe erosion particularly where seasonal high water has stripped a large portion of the solum. This condition is observed at Unit 1 which is within close proximity to the impoundment margin. The north profile of Unit 1 shows a small scarp indicating where the latest seasonal high water level scoured the surface Al horizon. The east profile of the same unit shows no surface Al horizon.

Topographically higher than Unit 1, Unit 2 illustrates considerably less erosion by comparison. But both units are developed in silt derived from loess which has been thoroughly leached of carbonates. These Units reflect the characteristic subsurface Bt horizon of the Fayette silt loam. Because of the apparent surface erosion at this site, cultural material has concentrated as a lag close or near the surface.



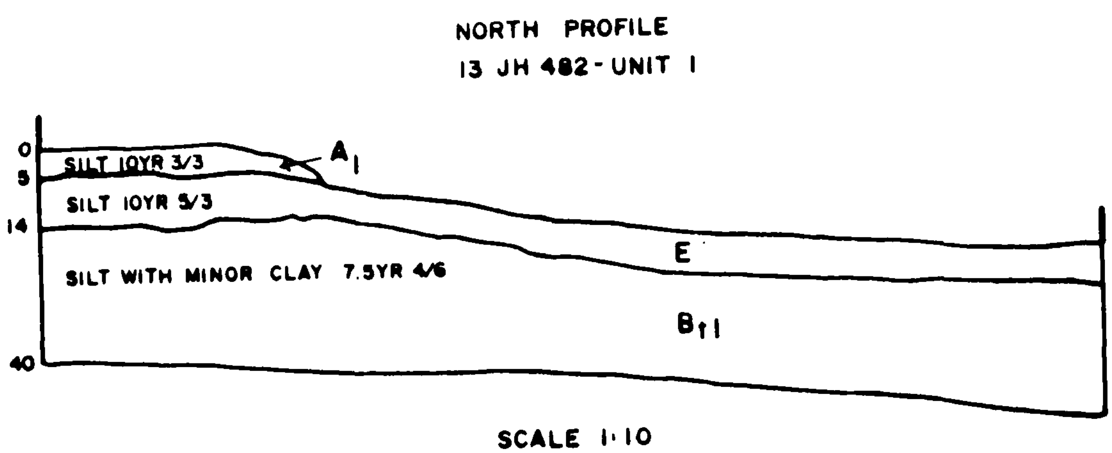


Figure 10: Stratigraphy at 13 JH 482.

13 JH 492:

This site is located on a spur that dips northwest toward the Iowa river and extends from the northeast-southwest trending main ridge (Figure 11). Within 3 meters from Unit 2 is an abrupt escarpment which descends approximately 15 meters to the Iowa river impoundment. The carbonate bedrock is overlain by pre-Illinoian till and Wisconsinan loess. This site like several others has suffered from accelerated surface erosion. Evidence from Units 1, 2, and 3 indicate that high reservoir levels have severely stripped the surface and subsurface horizons. Unit 2 represents the most severely eroded unit at the site. Nearly 2 meters of silt have been stripped from the surface with the entire solum absent from the profile.
Pre-Illinoian till is observed within 25cm. of the surface, with limestone bedrock exposed by 50cm. Unit 1 shows a similar profile, however this profile has experienced less erosion compared to Unit 2.

The least eroded profile seen at the site is observed in Unit 4, several meters upslope from the escarpment. The solum is developed in silt and shows the characteristic subsurface argillic horizon found in the Fayette silt loam series. The silt probe extended the profile of Unit 2 from 40cm. down to a depth of 325cm. The entire profile shows about 2 meters of leached loess underlain by leached, highly oxidized (7.5YR 5/8) sandy clay loam till. Like many of the other severely eroded sites, cultural material found at this site forms a lag deposit either at or very close to the surface.

13 JH 202: Woodpecker Cave

This site is located in a tributary valley which drains westward into the reservoir (Figure 12). The site has been buried by recent historical alluvium, however the depths of these historical deposits are not uniform across the valley. Historical flood deposits are commonly found in alluvial valleys. Several studies such as Knox (1977), Magilligan (1983), and Overstreet (1985: 264), have documented the existence of these historical alluvial units in the Upper Mississippi valley. These units are often heterogeneous and are characterized by flood lamina that indicate individual flood events. However, when only one sediment type is available and subsequently mobilized for transport, the unit will appear homogeneous and massive. Perhaps the most diagnostic characteristic of the unit is the lack of pedogenic development, particularly in comparison to the subjacent presettlement surface horizon.

The profile observed at Unit 3 is mantled by 66cm. of post settlement overbank vertical accretion deposits. This deposit shows some individual flood laminae that vary in thickness with the coarser alluvial laminae seen closer to the base of the historical deposit.

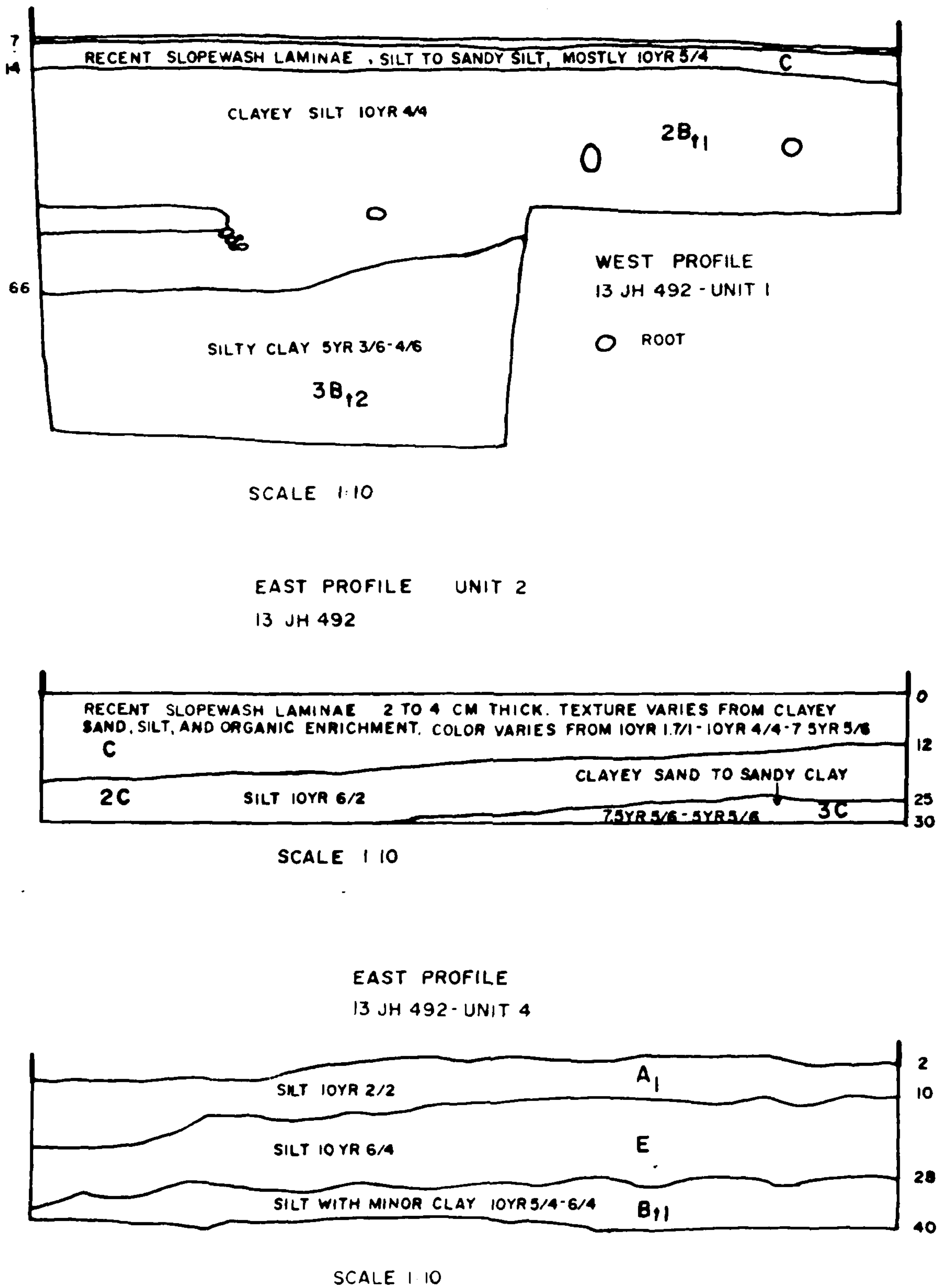
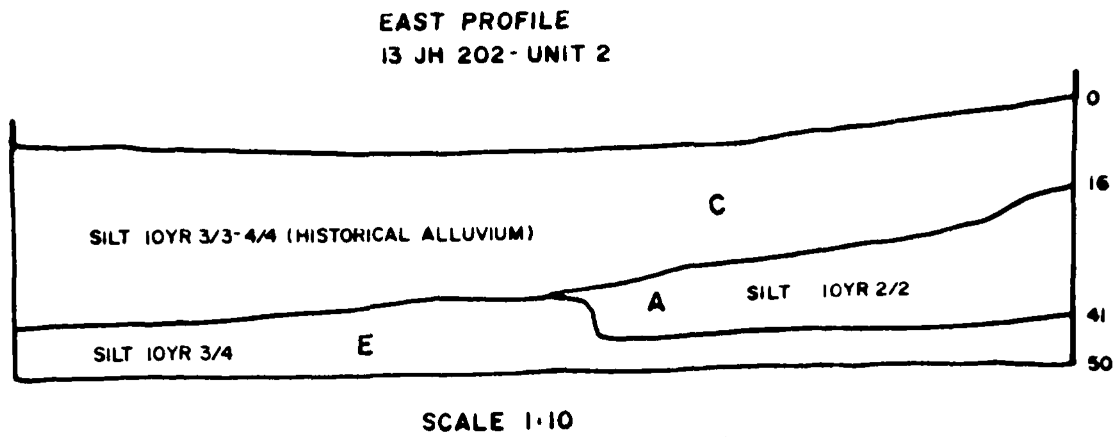


Figure 11: Stratigraphy at 13 JH 492.



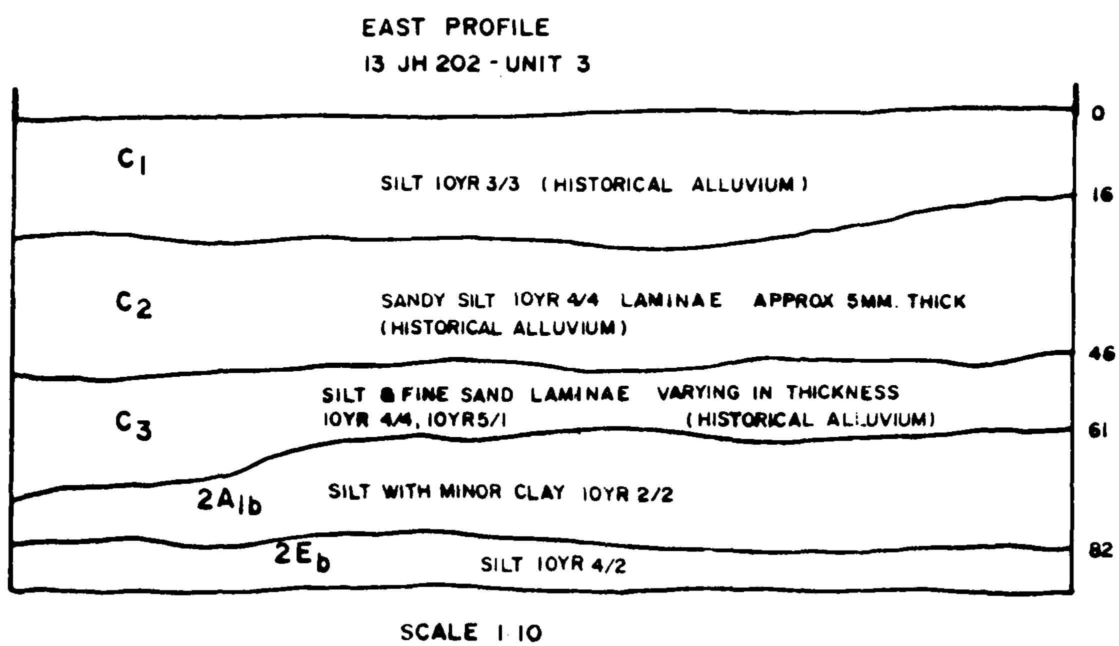


Figure 12: Stratigraphy at 13 JH 202.

The presettlement soil which is subjacent to the recent alluvial deposit, is developed in Holocene mixed lateral and vertical accretion silts, sand, and gravel. The solum is developed in silt and has been leached of carbonate material. A silt probe core was taken from the base of the excavated unit extending the profile to a depth of 132cm. A leached mottled and gleyed weak argillic horizon was observed between 105cm. and 125cm. But below 125cm., texture coarsened and refusal from highly calcareous point bar sand and gravel occurred at 132cm. The profile closely resembles the Arenzville series.

Further away from the main stream channel and topographically lower is excavation Unit 2 (Figure 12). Historical alluvium overlies a scoured presettlement A1 horizon. This lower surface seen in the valley appears to be an overflow channel during periods of high magnitude discharge. Initial settlement of this area must have provided a sufficient increase in surface runoff in order to produce higher stream flow volume and velocity necessary to scour the presettlement A1 horizon. Subsequent alluviation has since then buried the former surface.

A silt probe core extended the profile in Unit 2 to 64cm. where refusal from calcareous gravel was encountered. The solum is considerably thinner and not as well developed as the solum seen in Unit 3. No argillic horizon was identified in Unit 2 which suggests that this presettlement soil is younger than the buried soil observed at Unit 3.

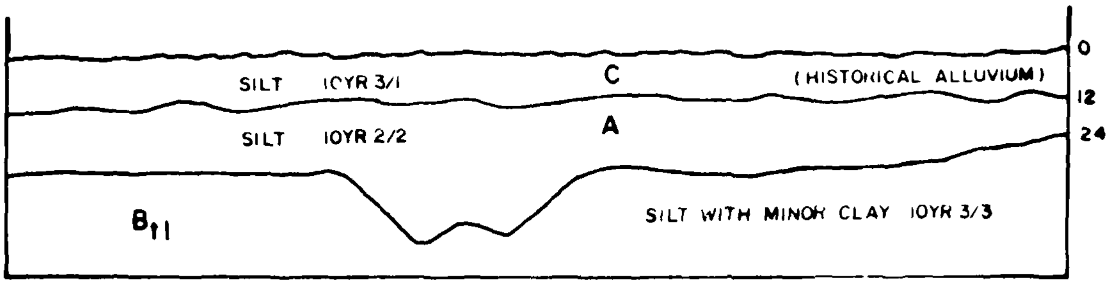
13 JH 479:

This site is located in the valley of a small 4th order tributary which flows east to the Iowa river impoundment. The site lies within the older Southern Iowa Drift Plain although the Iowan erosion surface margin is within 1 mile to the west of the site. The upper reaches of the watershed drains a portion of the Iowan surface. One of the excavation units is positioned on a footslope situated on the north side of the valley, while the other units are located on lower alluvial surfaces adjacent the stream course.

Unit 3 is positioned on the footslope which is developed in silt probably mass wasted from the abutting steep valley side slope. Occasional well rounded outwash pebbles, with some erratics were found in the solum. The pebbles did not constitute a lag deposit characteristic of an erosional unconformity or alluvial point bar sequence. But instead they were randomly distributed in the silt matrix therefore supporting the mass wasting concept.

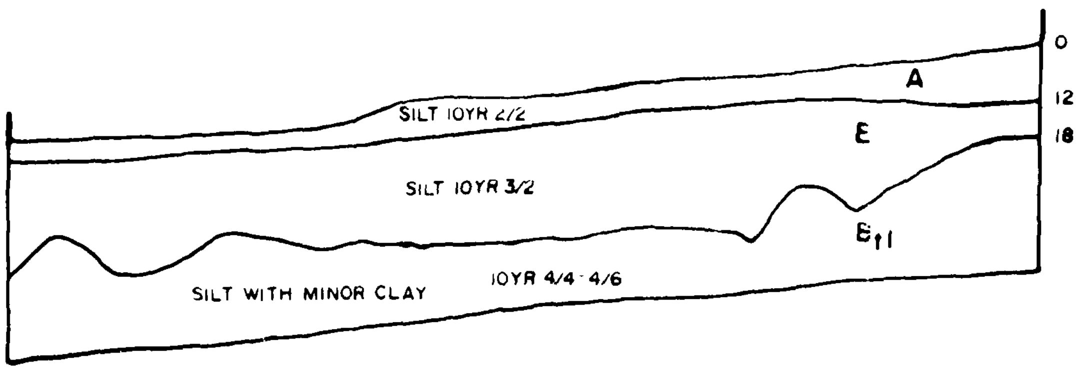
Although mapped as the Nodaway-Arenzville soil association, this unit more closely resembles the Fayette series because of the presence of a relatively well developed subsurface Bt horizon in addition to the relative lack of historical overburden. Only a few centimeters of historical slope wash cap the surface (Figure 13).

NORTH PROFILE
13 JH 479 - UNIT 2



SCALE 1:10

WEST PROFILE
13 JH 479 - UNIT 3



SCALE 1:10

Figure 13: Stratigraphy at 13 JH 479.

A silt probe core was taken from the bottom of excavation Unit 3 and continued to a depth of 190cm where refusal from sand and gravel occurred. The Bt horizon which begins about 30cm. continues to approximately 150cm., then texture begins to coarsen toward the base of the profile. The entire profile is leached of carbonates with the exception of the basal sand and gravel which is highly calcareous.

Unit 2 (Figure 13) is located on a low alluvial terrace close to the modern floodplain and stream course. The terrace is composed of mixed lateral and vertical accretion deposits, with a thin veneer of post settlement alluvium capping the surface. This terrace has apparently been stable for a considerable period of time. Evidence supporting this idea was seen in the subsurface B horizon which showed argillans coating the ped faces. Clay skin development requires a considerable length of time which has been demonstrated by Parsons et al. (1962) in northeast Iowa. In his study, clay films were absent from the the youngest 1000 year old effigy mound profiles, while the oldest 2500 year old mound profiles showed prominent clay film development along ped faces.

A silt probe core continued the profile from the bottom of the excavation unit to a depth of 200cm. Texture began to coarsen by 115cm. and by 200cm. refusal was encountered from sand and gravel. The entire profile of Unit 2 was leached of carbonate material.

Discussion:

The Coralville reservoir area can be divided into 2 physiographic regions; the Hawkeye Wildlife area located in the Iowan physiographic region and the pre-Illinoian drift region which contains the Iowa river gorge. Historical land use modifications beginning with the arrival of European settlers during the first half of the nineteeth century, has produced significant landscape modifications in both physiographic provinces. The impoundment of the Iowa river has further complicated the multiple effects of modern land use.

The Hawkeye Wildlife area which constitutes a broad valley incorporates multiple alluvial surfaces. Evidence illustrating this is seen in 2 additional cores taken near 13 JH 500 (Figures 14-15). Swisher 107 Core No. 1 was taken on a lower Holocene terrace about 200 meters west of 13 JH 500. The profile shows relatively little post settlement alluvium capping the surface and a presettlement soil developed in apparent channel fill deposits. Although it is impossible to evaluate the stratigraphic significance and areal extent of an alluvial chronology from a single silt probe core, this core suggests that an entirely different sedimentological sequence is found only a few hundred meters away from a higher terrace experiencing recent dramatic fluvial and eolian reworking.

SWISHER 107 -
CORE NO. 1

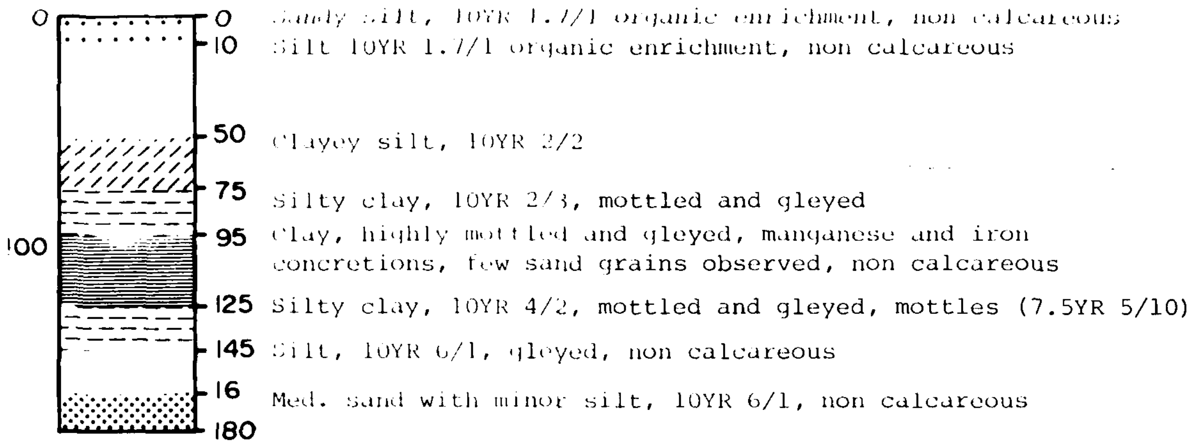


Figure 14: Swisher 107 - Core No. 1.

SWISHER 107- CORE NO.2

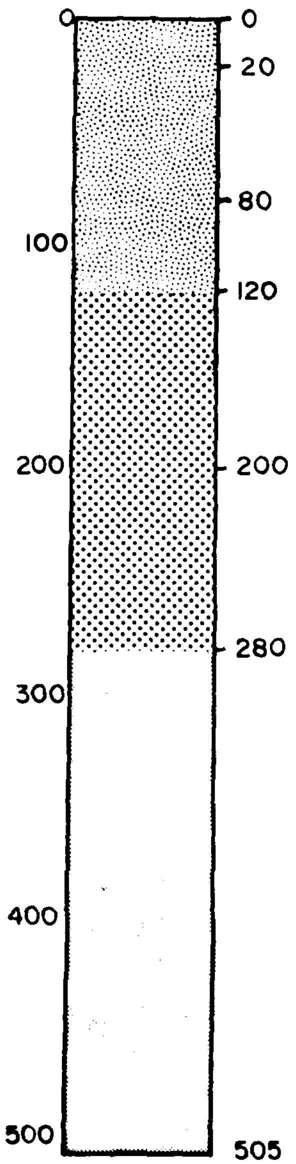


Figure 15: Swisher 107 - Core No. 2.

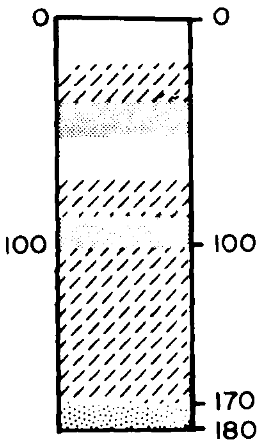
Swisher core No. 2 was taken about 400 meters west of the extreme southeast corner of section 31 Jefferson township where the east/west township road meets the north bound access road to the wildlife area. This higher terrace surface shows an alluvial sequence that more closely resembles 13 JH 500, however these sediments are slightly finer textured, they have fewer iron oxide coatings, and become calcareous toward the base as opposed to those at 13 JH 500.

Further upstream in the Wildlife area another core was taken close to the channel margin of the Iowa river. The location of the core was in the extreme western end of the Corps of Engineers land (NW 1/4, SW 1/4, NE 1/4, Sec. 31, T 81 N, R 8 W). Amana 37 Core No. 1 (Figure 16) shows historical flood laminae to a depth of about 1.0 meter, then an abrupt presettlement contact is observed. The degree of surface soil development indicates that this surface has been stable for at least some time during the late Holocene.

The previous examples demonstrate that a complex alluvial chronology exists in the Iowa river valley west of Interstate 380 in the Hawkeye Wildlife area. What was formerly mapped as floodplain (F), and terrace (TAP) (Emerson, 1983) does not adequately define the multiple surfaces observed in the field at the Wildlife area. The knowledge and understanding of the relative ages and areal extent of these surfaces would prove invaluable as a cultural management tool, yet to date, little is known about their distribution across the Iowa river valley. Likewise, the possibilities surrounding buried surfaces in alluvial fans and colluvial footslopes have yet to be adequately evaluated. It is suggested that the Iowa river valley in the Hawkeye Wildlife area be seriously addressed in order to develop a predictive chronologic alluvial landform model based upon rigorous stratigraphic studies across the valley. The benefits of such a model will be an invaluable tool for cultural resourse management in this portion of the Coralville reservoir.

To the east of Interstate 380 the Iow river is confined to a narrow pre-Illinoian gorge and constitutes the other physiographic province of the Coralville reservoir. As a result of high water levels associated with impoundment, the former floodplain and perhaps Holocene terraces are now inundated. In addition, severe erosion has occurred in response to maximum pool elevations. The effects of high pool levels has stripped the surface horizons and in some cases subsurface horizons while concentrating cultural material on the surface as a lag deposit. This condition was particularly evident at 13 JH 482, and 13 JH 492 where Pleistocene sediments were exhumed. In contrast, site 13 JH 479 escaped both post reservoir erosion and historical sedimentation (Figure 17). Walking up the main channel to lower ordered stream segments, historical alluvium becomes more pronounced. In the 2nd order reaches of this 4th order basin, historical sedimentation of about 1.0 meters can be

AMANA 37-CORE NO. 1



Alternating bands of silt, organic enriched silt, clayey silt, and fine sand. Color varies from 10YR 2/2, 10YR 3/3, to 10YR 4/4 for the fine sand

Calcareous

Clayey silt, 10YR 3/2, mottled and gleyed, weakly calcareous. Iron concretions

Non calcareous at 140 cm., angular quartz granule observed

Silty sand, 10YR 3/3, mottled and gleyed, non calcareous

Figure 16: Amana 37 - Core No. 1.

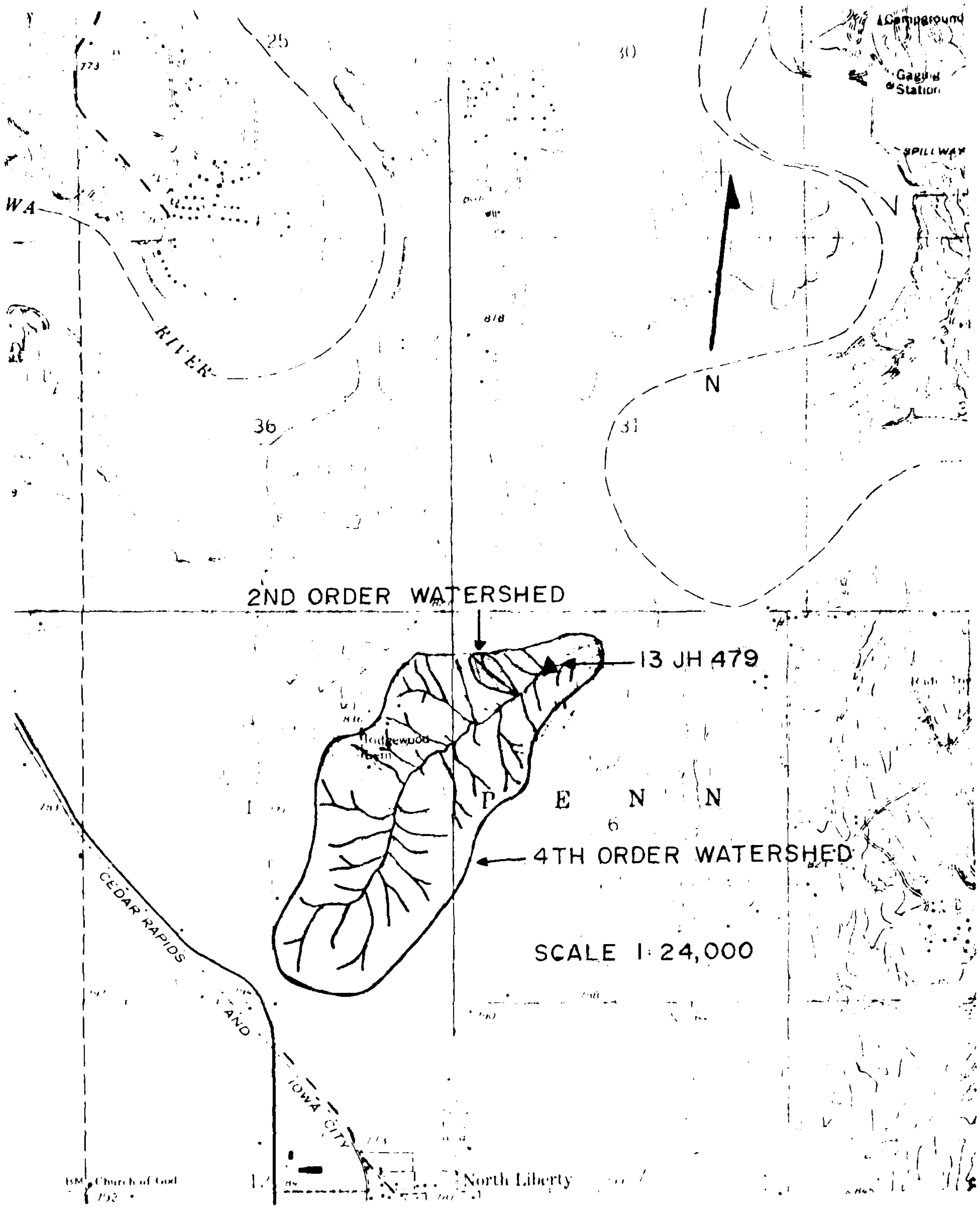


Figure 17. Shows position of 2nd order watershed within the geographic boundary of the larger 4th order watershed. The larger watershed drains both the Iowan and pre-Illinoian physiographic provinces.

observed. The historical slope wash debris stored in the 2nd order drainages has steepened the valley gradient sufficiently to initiate an episode of entrenchment. The fine grained sediment being actively eroded in these drainages appears to be transported out of the basin as suspended load, whereas the coarser bedload material is being mobilized for local transport remaining higher up in the drainage network. The probability of a rare high magnitude hydrologic event occurring sometime in the furture may mobilize this bedload material stored upstream for transport downstream toward the mouth of this 4th ordered basin.

This example illustrates the complex relationship between cut and fill episodes found within a relatively small drainage network. The geomorphic processes occurring in the headwater reaches are likely to differ in both magnitude and direction when compared to processes acting downstream. Important questions surrounding watersheds of this nature focus upon identifying reaches where sediment storage and sediment flushing are actively occurring as opposed to reaches where grade has been maintain for relatively long periods of time. Watersheds of this type located in the Iowa River gorge require careful geomorphic consideration when used to assist a comprehensive cultural management program in this area of Coralville Reservoir.

Therefore, in order to identify these stable reaches located in the lower ordered basins and the preserved surfaces in the main valley upstream from Interstate 380, a rigorous and comprehensive geomorphic study should be conducted. The study should include detailed alluvial chronologies which can only be attained through intensive field investigations.

The field methodology should begin with a program designed to obtain as much indirect morphologic information about the reservoir area before the implementation of direct field studies. This would include an analysis of original land survey documents in order to determine the extent of lateral stream migration particularly in the Iowa river valley west of Interstate 380 during the last century. Information obtained from these historical documents and compared to the current topographic maps would provide initial information about the areas within the valley that have been reworked over the last century.

Stereographic air photographs should be used to identify discrete topographic changes throughout the Iowa river valley and along the valley margin. Terrace outliers and alluvial fans contained within the valley walls, would have a high potential for site burial and could be identified through areal photographic interpretation.

Discussion with professionals familiar with the Iowa river valley should be conducted. This is important because people associated with the Iowa Geologic Survey, the University of Iowa, and the Soil Conservation Service are most familiar with the study area. Communication with these individuals should help to refine the geomorphologist's field strategy before implementation of a coring and sampling program.

After the indirect field information has been compiled and evaluated direct field operations should be implemented. In the Hawkeye Wildlife area and in the small ordered watersheds in the Iowa River gorge, close interval coring across the valleys should be conducted in order to determine the chronology of geomorphic events. The use of silt probe core, and bucket auger should provide the major sampling methodology because these tools can access areas where mechanized equipment is unsuitable. The combination of the silt probe which produces intact cores and the bucket auger which provides a large sample can reconstruct detailed stratigraphy to depths often greater than 3 meters which may be sufficient in reconstructing alluvial chronologies on Holocene surfaces in the Coralville reservoir area. In fact the silt probe has the capability of recovering cores from depths greater than 6.0 meters (Overstreet, 1985:79). However, in areas accessible by power equipment such as higher terraces and alluvial fans the Giddings power probe and backhoe trenches should be employed since they generally provide the best stratigraphic preservation. The point being that stratigraphic studies should not be biased or limited because of the dependence upon only one field technology.

Upon completion of detailed field work the samples should be processed for particle size determination, organic carbon analysis, and for the presence of carbonates. These methodologies will provide documentation of pedogenic development (or lack of development) associated with surface stability (or instability). Furthermore when coring in alluvial valleys near or below the water table, the mottled and gleyed conditions of the sediments and the presence of iron and manganese concretions can sometimes mask weakly developed buried surfaces. In environments above the water table particularly in alluvial fans and higher terrace surfaces, buried surface (A1) horizons usually become oxidized and lose their characteristic black (10YR 2/1) color. The prescribed laboratory proceedures are sensitive and should be able to identify weakly developed buried surface and subsurface horizons if they are not obvious in the field.

An effective research model aimed at determining the geochronology of the Coralville Reservoir area must produce a rigorous program designed to incorporate intensive indirect and direct field methodology with meaningful laboratory procedures. The result of this effort will provide a useful evolutionary landscape model based upon direct empiricle studies of different aged surfaces within the reservoir margins. A study of this nature would enhance the desired predictive archaeological site distribution model. Such a model of course is predicated upon sound understanding of past landscapes and associated climatic patterns. In turn, the feedback between models of past landscapes and models of past cultural systems will result in more effective management of the archaeological data base.

REFERENCES CITED

ALDEN, W.C. and M.M. LEIGHTON

1917 The Iowan Drift: A Review of the Evidences of the Iowan Stage of Glaciation. Iowa Geological Survey Vol. XXVI, Annual Report for 1915.

AHLER, STEVEN R.

1984 archaic settlement strategies in the Modoc Locality, Southwest Illinois. Ph.D. Dissertation, University of Wisconsin-Milwaukee.

ANDERSON, ADRIAN D.

1971 Review of Iowa River Valley Archaeology. In: Prehistoric Investigations, Marshall McKusick (ed.), Report No. 3. Iowa City: Office of the State Archaeologist.

1971a The Late Woodland Walters Site. In: Prehistoric Investigations, Marshall McKusick (ed.), Report No. 3. Iowa City: Office of the State Archaeologist.

BERG, R.C.

1984 The Origin and Early Genesis of Clay Bands in Youthful Sandy Soils along Lake Michigan, U.S.A. Geoderma 24: 71-85.

CABLE, E.J.

1921 Some Phases of the Pleistocene of Iowa, PhD dissertation, The University of Iowa, Iowa City.

CALDWELL, WARREN W.

1961 Archaeological Investigations at the Coralville Reservoir, Iowa. River Basin Survey Papers No. 22, Bureau of American Ethnology Bulletin No. 179. Washington, D.C., Smithsonian Institution.

DAVIS, M.W. and TROWBRIDGE

1883 Mound Builders and Indians. In: History of Johnson County, Iowa, pp. 289-290. Johnson County History Company. Iowa City, IA.

DIJKERMAN, J.C., M.G. CLINE and G.W. OLSON

1967 Properties and Genesis of Textural Subsurface Lamellae. Soil Science 104: 7-16.

DUNNE, T. and L.B. LEOPOLD

1978 Water in Environmental Planning. W.H. Freeman and Co., San Francisco. 818p.

EMERSON, PATRICIA M., HARLAN R. FINNEY, FREDERICK W. LANGE and DAVID S. RADFORD

1984 The Cultural Resources and Geomorphology of Coralville Lake, Johnson County, Iowa. Report submitted to U.S. Army Corps of Engineers, Rock Island District, Contract No. DACW25-83-C-0065. Impact Services Incorporated. Mankato, Illinois.

FINNEY, H.R.

1984 Detailed Descriptions and Laboratory Analysis of Soils and Underlying Materials, In: The Cultural Resources and Geomorphology of Coralville Lake Johnson County, Iowa P.M. Emerson author, Vol. II Impact Services, Inc. Mankato, Mn.

HALLBERG, G.R.

1980 Pleistocene Stratigraphy In East-Central Iowa Technical Information Series #10, Iowa Geological Survey

HALLBERG, G.R., T.E. FENTON, G.A. MILLER and A.J. LUTENEGGAR

1978 The Iowan Erosion Surface: An Old Story, and Important Lesson, and some New Wrinkles. in R.R. Anderson (ed.) 42nd Annual Tri-State Geological Field Conference Guidebook, Iowa Geological Survey.

HERSHEY, H.G.

1969 Geologic Map of Iowa Iowa Geological Survey. Scale 1:500,000

IRISH, CAPT. F.M.

1868 History of Johnson County, Iowa. In: Annals of Iowa, Series I, Vol. 6: 23-331. Iowa City, IA.

KNOX, J.C.

1972 Valley Alluviation in Southwestern Wisconsin Annals of the Association of American Geographers Vol. 62: 401-410.

1975 The Response of Floods and Sediment Yields to Climatic Variation and Land Use in the Upper Mississippi Valley. Institute for Environmental Studies, Report 52, University of Wisconsin, Madison.

1976 Impact of Fluvial Erosion on the Great Plains Altithermal Cultural Hiatus. Anthropology on the Great Plains: The State of the Art 1976 Symposium Joint Plains-Midwest Anthropological Conference, Mpls. Mn. Oct. 20-22, 1976.

1977, *Human Impacts on Wisconsin Stream Channels.* Annals of the Association of American Geographers Vol. 67, 3: 323-342.

1979 Hydrogeomorphic Implications of Climatic Change. Center for Geographic Analysis and Department of Geography, University of Wisconsin, Madison.

1983 Responses of River Systems to Holocene Climates. In: Late-Quaternary Environments of the United States: The Holocene, H.E. Wright Jr. ed. University of Minnesota Press. Minneapolis, Mn.

1984 Fluvial responses to Small Scale Climatic Changes. In: Developments and Applications of Geomorphology. John E. Costa and P. Jay Fleisher (eds.) Springer-Verlag, 1984 p. 318-342.

LEIGHTON, M.M.
1916 The Pleistocene History of the Iowa River Valley, North and West of Iowa City in Johnson County. Iowa Geological Survey Vol. XXV, Annual Report for 1914.

LEWIS, RICHARD
1979 Archaeological Reconnaissance Survey: Proposed Sewage Lagoon, Dam Site Recreation Area, Coralville Lake, Iowa River, Iowa. U.S. Army Corps of Engineers, Rock Island District. Rock Island, IL.

LOGAN, WILFRED D.
1976 Woodland Complexes in Northeastern Iowa. U.S. Department of the Interior National Park Service Publications in Archaeology 15. Washington D.C.

MAGILLIGAN, F.J. IV.
1983 Historical Floodplain Sedimentation in the Galena River Basin, Southwest Wisconsin, Northwest Illinois. Unpublished M.S. thesis, University of Wisconsin, Madison.

OVERSTREET, DAVID F.
1984b Archaeological Investigations at the Grant River Public Use Area. Great Lakes Archaeological Research Center, Inc., Reports of Investigations No. 149. Wauwatosa, Wi.

1985 Archaeological Investigations, Navigation Pool 11, Upper Mississippi River Basin. Great Lakes Archaeological Research Center, Inc., Reports of Investigations No. 151. Wauwatosa, Wi.

PARSONS, R.B., W.H. SHOLTES and F.F. RIEKEN
1962 Soils of Indian Mounds in Northeastern Iowa as Benchmarks for Studies of Soil Science. Soil Science Society Proceedings, p.491-496.

PRIOR, J.C.
1976 A Regional Guide to Iowa Landforms Iowa Geological Survey Education Series, No. 3.

RASPET, CAROL A.
1979 A production stage analysis of lithic artifacts from the Lightline Lake Site, Le Flore County, Mississippi. M.A. Thesis, University of Mississippi, Oxford.

ROETZEL, KATHLEEN A. and RICHARD A. STRACHAN
1980 An Archaeological Investigation of the Proposed Lagoon Site, Dam Site Recreation Area, Coralville Lake, Iowa. Report submitted to the U.S. Army Corps of Engineers, Rock Island District. Rock Island, IL.

RUHE, R.V.
1969 Quaternary Landscapes of Iowa Iowa State University Press, Ames, Iowa. 255p.

RUHE, R.V., W.P. DIETZ, T.E. FENTON and G.F. HALL
1965 The Iowan Problem: Field Trip Guidebook, 16th Annual Midwest Friends of the Pleistocene Meeting, Iowa Geological Survey.

1968 Iowan Drift Problem, Northeastern Iowa, Report of Investigations 7, Iowa Geological Survey.

RUHE, R.V. and J.C. PRIOR
1970 Pleistocene Lake Calvin, Eastern Iowa. Geological Society of America Bulletin, Vol. 81, p. 919-924.

SALISBURY, N.E., J.C. KNOX and R.A. STEPHENSON
1968 THE VALLEYS OF IOWA-1: Valley Width and Stream Discharge Relationships in the Major Streams. Iowa Studies in Geography, Department of Geography, The University of Iowa, Iowa City, Iowa. 107p.

SCHERMER, SHIRLEY
1983 Coralville Reservoir Shoreline Survey. Research Papers, Volume 8, Number 2, Office of the State Archaeologist. University of Iowa. Iowa City, Iowa.

SCHERMERHORN, E.J.
1983 Soil Survey of Johnson County, Iowa. U.S.D.A. Soil Conservation Service and the Department of Soil Conservation, State of Iowa.

SCHUMM, S.A.
1973 Geomorphic Thresholds and Complex Response of Drainage Systems. In: Fluvial Geomorphology. Marie Morisawa (ed.), Proceedings of the Fourth Annual Geomorphology Symposia Series, Binghamton, New York. Allen and Unwin, London. p. 299-310.

1977 The Fluvial System. Wiley and Sons Inc., 338p.

SCOTT, REVEREND JAMES L.
1843 A Journal of a Missionary Tour through Pennsylvania, Ohio, Indiana, Illinois, Iowa, Wisconsin and Michigan. Privately Published. Providence, RI.

STARR, FREDERICK
1895 Summary of the Archaeology of Iowa. In: Proceedings of the Davenport Academy of Natural Sciences, Vol. 6: 53-124. Davenport, Iowa.

TIFFANY, JOSEPH A.
1981 The Keyes Archaeological Collection: A Finder's Guide. Iowa State Historical Department. Des Moines, Iowa.

VAN ZANT K.L. and G.R. HALLBERG
1976 A Late-Glacial Pollen Sequence From Northeastern Iowa: Sumner Bog Revisited, Technical Information Series #3, Iowa Geological Survey.

VREEKEN W.J.
1975 Quaternary Evolution in Tama County, Iowa. Annals of the Association of American Geographers Vol. 65, 2: 283-296.

WARD, REVEREND DUREN J.H.
1903 Historic-Anthropological Possibilities in Iowa. Iowa Journal of History and Politics, Vol. 2: 34-68.

1904 Some Iowa Mounds: An Anthropological Survey. Iowa Journal of History and Politics, Vol. 2: 34-68.

1905 The Problems of the Mounds. Iowa Journal of History and Politics, Vol. 3: 20-40.

WEBB, THOMPSON III and R.A. BRYSON
1972 Late-and Postglacial Climatic Change in the Northern Midwest, USA. Quantitative Estimates Derived from Fossil Pollen Sprectra by Multivariate Statistical Analysis. Quaternary Research 2: 70-115.

WEBB, T. III, E.J. CUSHING and H.E. WRIGHT Jr.
1983 Holocene changes in the vegetation of the Midwest. In Late-Quaternary Environments of the United States, The Holocene, H.E. Wright Jr., (ed.) University of Minnesota Press. Minneapolis, MN.

WEICHMAN, MICHAEL S.
1975 The Johnson County - Coralville REservoir Road Improvement Project. Environmental Research Center, Research Report No. 20.

WEICHMAN, MICHAEL S. and JOHN TANDARICH
1974 An Overview of Known Archaeological Sites within the Iowa River Valley: Coralville to the Cedar River. Environmental Research Center, Report No. 10.

WENDLAND, W.M. and R.A. BRYSON
1974 Dating Climatic Episodes of the Holocene. Quaternary Research 4: 9-24

WHEELER, RICHARD P.
1949 Appraisal of the Archaeological Resources of the Coralville Reservoir, Iowa River, Iowa. Smithsonian River Basin Surveys, Washington D.C.

WRIGHT
1976 The Dynamic nature of Holocene Vegetation: Holocene Stratigraphy and Paleoclimatology, Biogeography, and Stratigraphic Nomenclature: Quaternary Research 6: 581-596.

ZALESKY, JAMES
1977 A Collection of Surface Finds from East Central Iowa. Manuscript, Iowa State University, Ames.

ZIEGLOWSKY, DEBBY and JAMES ZALESKY
1981 The Coralville Reservoir: A status Report, 1980. Research Papers, Vol. 6, No. 4. Office of the State Archaeologist. University of Iowa, Iowa City, Iowa.

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